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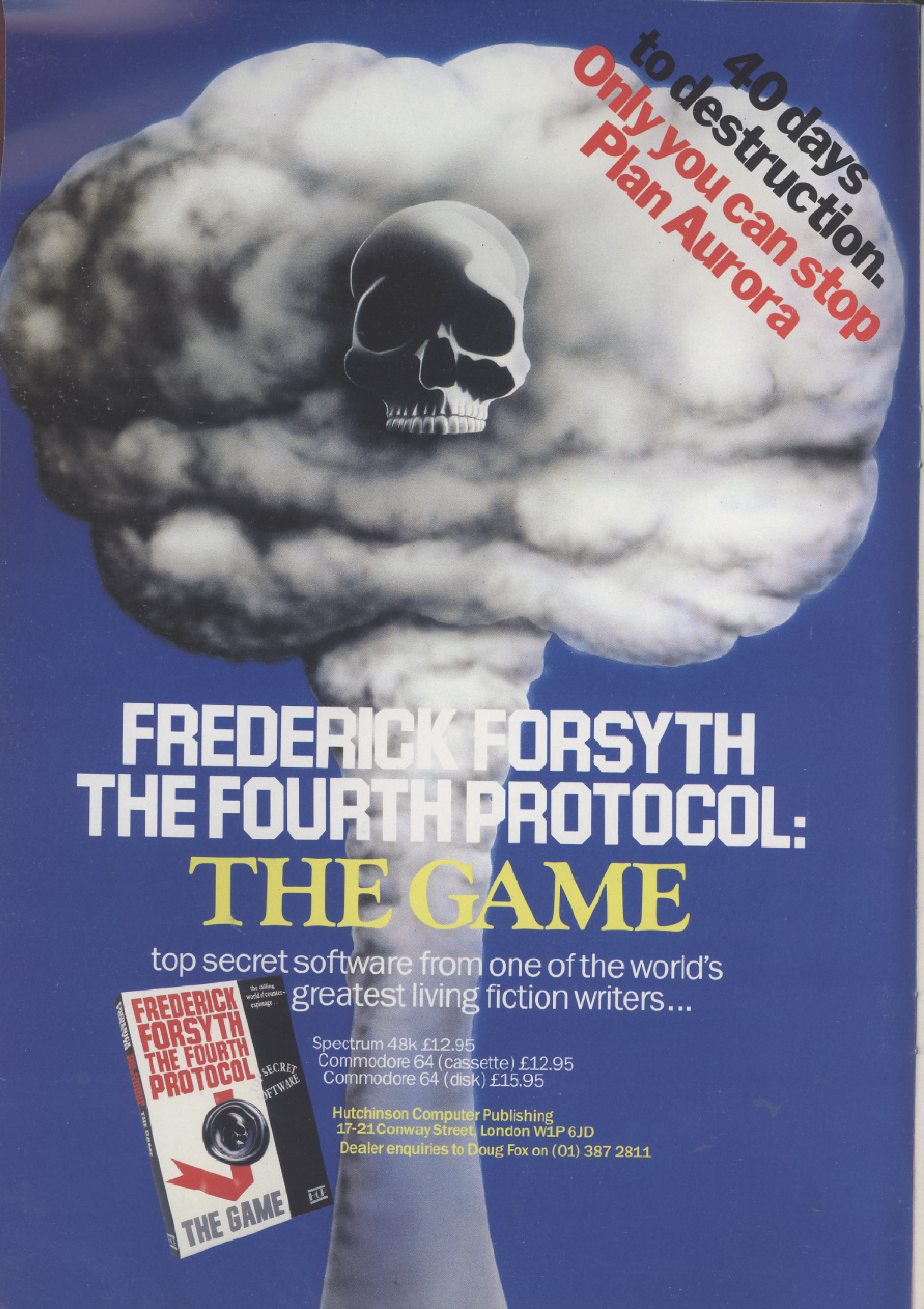
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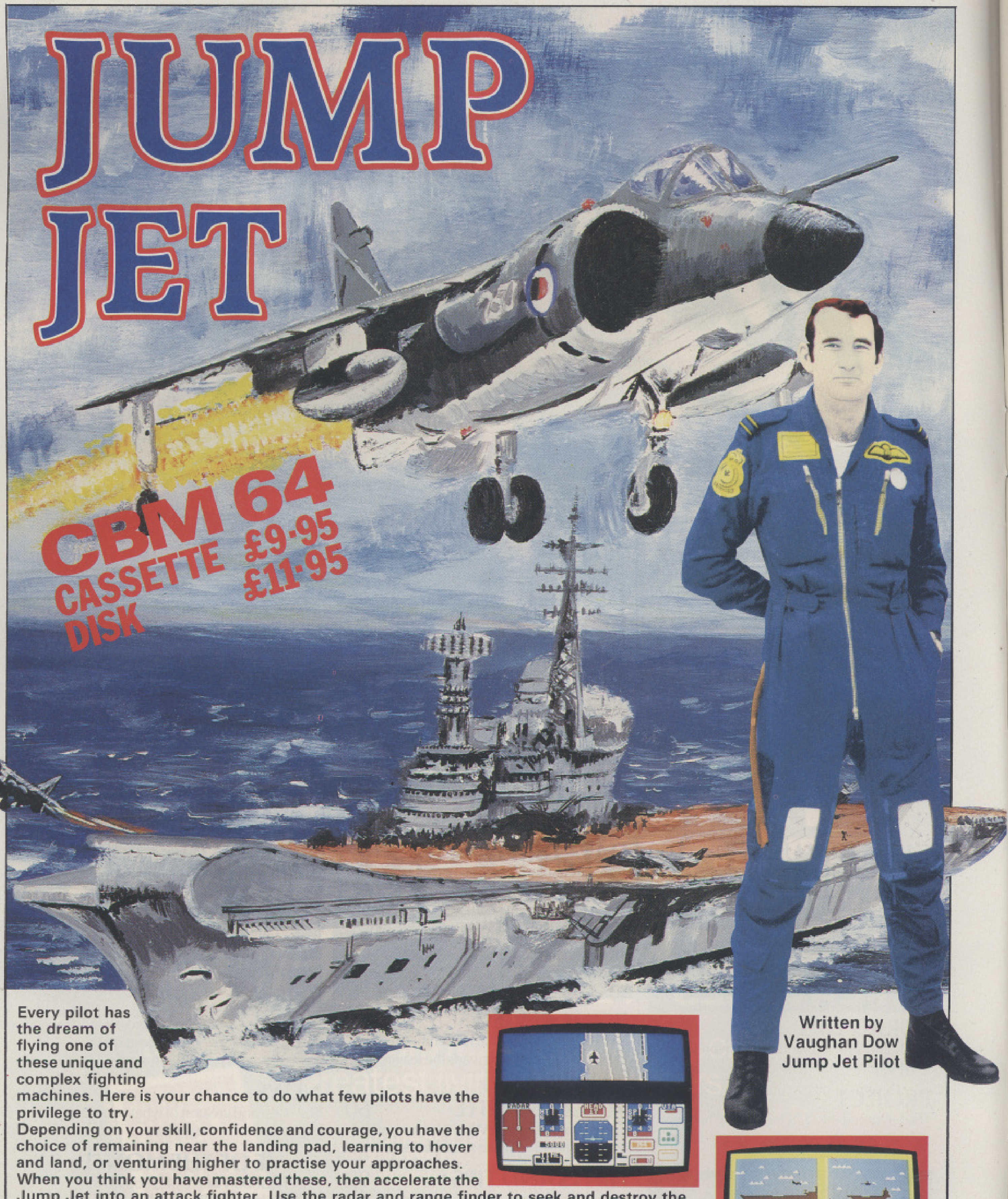

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You are now ready to proceed to the next skill level to face additional hazards, such as unpredictable swell and treacherous cross-winds.
Be warned, this program is not a toy or game. You will need to co-ordinate your hands, eyes and mind to successfully complete each mission. Do not hope to achieve in a short time that which took the author three years to learn as a Jump Jet pilot, and over a year to record on this computer program.

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Auction to aid Ethiopia

To back up the £250,000 success of Soft Aid, the computer industry is hoping to raise more money through an auction.

Held at County Hall on London's South Bank, the auction will include computer software donated by Argus, US Gold, Pitman and Gilsoft. But the sponsors are also requesting donations of old and unwanted software from the public. "We are interested in getting as much software from whatever source, which we will then auction," says Greg Ingham, editor of Computer Trade Weekly which is organising the event.

The auction starts at 11am on Saturday, 15 June and goes until 5pm. Admission is free.

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UK shuffle continues; profits fall

You could call it the UK shuffle and make it sound like a new dance craze, but it's the craze at Commodore UK where the turnover of top personnel makes the idea of a turnstile more and more feasible.

The departure of David Gerrard as UK Marketing Manager (reported last month) has prompted the promotion of UK Sales Manager Paul Welch to the position — or a version of it, at least, since it is a combination of the two posts. As a result, Welch is now UK Manager, Marketing and Consumer Sales. He will be reporting directly to Nick Bessey, the low-profile UK General Manager from whom little has been heard since his appointment a couple of months ago.

"Obviously there are a number of marketing and sales issues that need to be addressed immediately," Welch says. "The first of these is to implement new marketing programmes for our current range of home computer products which will ease the current over-stocking problem faced by the trade and generate the kind of demand that damaging price cuts have failed to achieve."

Paul Welch

Reading between the lines, Commodore is quite concerned about the concern shown by retailers who are refusing to buy more Commodore computers until they unload those they already have. Rumours about an exit from the product line by the 64 with the advent of the compatible 128 don't help either. That isn't to worry existing 64 users, though, nor those considering buying the machine since it and software to go with it will be available for a very long time to come.

CBM has slight money worries

On the world scene, Commodore International has even better reason to worry. The Financial Times reported that the company, based in the US, registered a dramatic loss during the third quarter of its fiscal year compared to a generous profit for the same period a year ago.

The third quarter, ending 31 March, showed a net loss of $20.8 million, or 67 cents a share. That's compared to profits of $36.3 million, or £1.18 per share, during the same quarter in 1984. As a result, net earnings for the first nine months dropped from $110.7 million in 1984 to $10.1 million this fiscal year.

FT quoted Commodore International Chairman Irving Gould as saying that the drop was due to "a price reduction in February, a reluctance of retailers to rebuild rapidly their depleted Commodore products inventory and by the general slowdown in our non-US sales."

Commodore seems to be hoping for a rescue by its PC-10 and PC-20 along with the even newer 128. But supply problems with the PCs in Britain are not a good sign and much of the hope will be riding on the 128, a machine that works in three modes including 64 compatibility and CP/M operation.

Take The Mickey

US Gold's appetite for software is enormous and apparently still unsatisfied. The once games orientated company recently cooked up a deal with none other than Walt Disney Productions.

Walt Disney signed an exclusive license with the UK software company to create new educational-games programs and market those already ex-

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isting in the US on the UK market — all based on established Walt Disney films or new ones coming up during this year. US Gold also has the character license for all or any Walt Disney characters, including the famous Mickey Mouse, Donald Duck and Winnie the Pooh.

Disney Productions are launching two major film releases this year. The first is the follow up to Wizard Of Oz entitled Return To Oz, scheduled for release in August. US Gold, along with Ocean Software, will produce the computer program of the film, planned for release "during the Prime Autumn sales period."

The second new release is due out in October and is called The Black Cauldron. No date has been set for the corresponding computer game. Meanwhile, US Gold and Ocean will also be working on a program based on the characters of Walt Disney's Jungle Book.

Three titles already marketed in the US will soon be available in the UK through this arrangement. Since the programs are only on disk in America, where most compter owners also own disk drives, they may be available in Britain on disk only. US Gold says it is looking into the feasibility of putting the programs on cassette. The titles are:

——— Mickey's Space Adventure, for ages 8 and upwards, featuring 150 screens with elements of problem solving, map skills and planetary science. It will be on two double-sided disks for the 64 at £14.95.

———Winnie The Pooh In The Hundred Acre Wood, also an adventure for ages 7 upwards, focusing on map and reading skills and logical thinking. On one disk for the 64, it retails for £12.95.

———Donald Duck's Playground, a money-making game that encourages matching skills, logical thinking and making the changes. Price on one disk for the 64 is £12.95.

Release date for all of these is set for Christmas.

While US Gold is taking ample credit for the acquisition, the company also considers it a pat-on-the-back for its competitors, saying it "should be seen as credibility for the software industry in general as many Walt Disney films and characters have yet to even appear on video."

As if that weren't enough, US Gold have signed a similar contract with Muppet Productions. The first two releases will be Kermit's Electronic Story Maker — a spin-a-word writing kit for beginning readers aged 4 and up, and The Great Gonzo — described as "an electronic word builder" for beginning readers ages 6 and upwards.

Both Muppet programs come from Simon and Schuster in the US and are disk-based. Again the cassette option is being checked, but the disk version will sell for £12.95.

The new label for this "edutainment" range (Disney and Muppet) will be Kids!

Hopes for tech savings crashed

Computers and the rest of the technology family may not be the miracle that big business had hoped, but it seems the hopes may have been too high in the first place.

Senior managers in major banks and financial institutions surveyed in 26 countries told a professional service organisation that they believe their massive investments in high technology have had little strategic impact in banking. The study was undertaken by Touche Ross International management consultants during 1984. The final report was taken from results gathered in six countries — US, Canada, UK, France, Italy and West Germany.

Few of the managers reported any significant savings in operating costs compared to investment in new technology and most found that technology was unable to secure any long-lasting competitive advantages for the bank. Part of the reason may be the slow pace at which other parts of the banking operation are changing in line with technology, a problem Touche Ross attributes to lack of coordination. Many banks for example, have brought in new technology for its own sake rather than linking it with particular marketing policies.

Also, Touche Ross partner John Harrison says senior managers often are unfamiliar with computer technology and take the convincing word of the computer department, which obviously would like to see as much computerisation as possible. The result is that managers are led to expect too much from the investment, though basically it has been a good one.

On the other hand, successful banks harness what technology they already have with the addition of necessary new technology to meet a specific need. One example Harrison gave was the rapid adjustment to allow current accounts to be kept in foreign currency after exchange controls were abolished. "Speed is more and more the essence, not even so much here as in the American market," he said.

Touche Ross is an international organisation of firms of chartered accountants and management consultants located in 87 countries. The group is established under Swiss Law and shares technical and management resources. Complete copies of the survey are available from Department B15, Touche Ross & Co, Hill House, 1 Little New Street, London EC4A 3TR. Tel: 01-353 8011.

Menu for starters

An arcade starter pack for the C16 and four new games for C16 and Plus/4 are now on the market from Tynesoft.

The C16 Software Starter Pack sells for £14.95 and includes four games, Shoot-it, Hopp-it, Climb-it and Munch-it. Titles are self-explanatory and are mainly designed for the beginner. Four other arcade games that also run on the Plus/4 are Olympiad, Rig Attack, Lunar Docking and Zap-em. Each retails at £6.95.

Contact: Tynesoft, Addison Industrial Estate, Blaydon-On-Tyne, Tyne & Wear. Tel: 091-414 4611

Tape levies draw fire

The long-running controversy over levies on blank audio and video recording tapes has reared its ugly head once again.

A new government Green Paper recently received the scornful attention of the Tape Manufacturers Group whose members include major names like BASF, Memorex, Sony and JVC. The Green Paper was issued earlier this year as basically a consultative document and by no means is near becoming law. But the TMG says the new bend is a "total reversal" from a previous Green Paper issued in 1981 which dismissed the idea of such levies on blank recording material as a means of discouraging piracy.

The new strategy calls for a levy of 10 per cent on the price of audio cassettes and five per cent on video cassettes, but is vague on specifics of how such a law would be enforced.

"Under the new plans, any manufacturer or retailer selling cassettes not carrying a levy stamp could be fined up to £2,000," TMG says. "Anyone recording with an unstamped tape could be breaking the law and could be tried in the Civil Courts, even it their cassette was bought in a country where levies did not apply."

The levy is an effort by government to discourage illegal recording of audio and video materials, including commercial computer software. "It's like the Government adding £50 to the price of all cars sold to allow for offences that the owners might commit," TMG Chairman Christopher Hobbs said.

Manufacturers and importers would pay the levy with the resulting cost being passed on, naturally, to the consumer. "The levy scheme would be easily circumvented by importers bringing in tape from overseas and undercutting the legitimate local product," TMG holds. "The incentives to counterfeiters to copy the levy stamp would be enormous."

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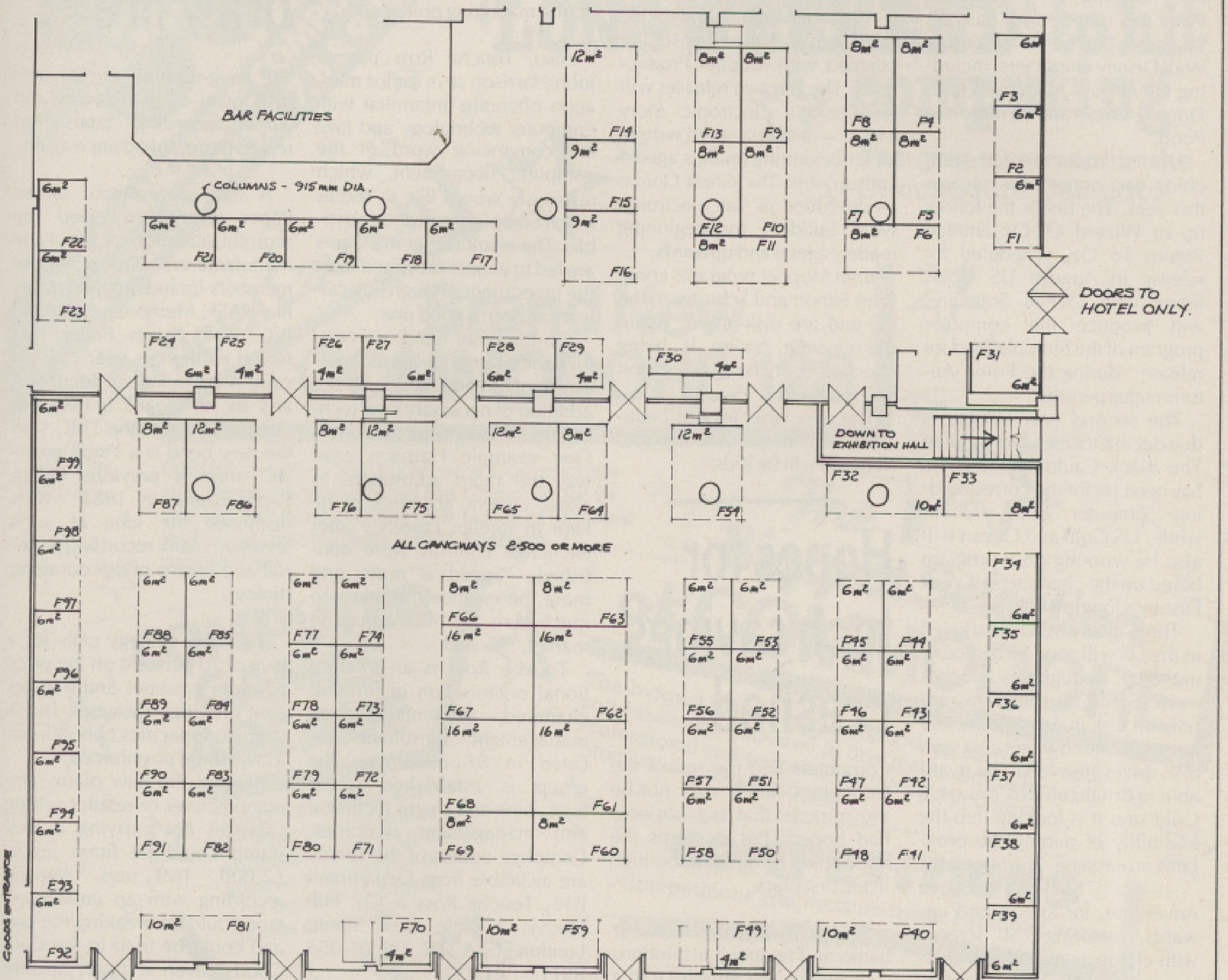
6th COMMODORE COMPUTER SHOW NOVOTEL, LONDON, 7, 8, 9 June 1985.



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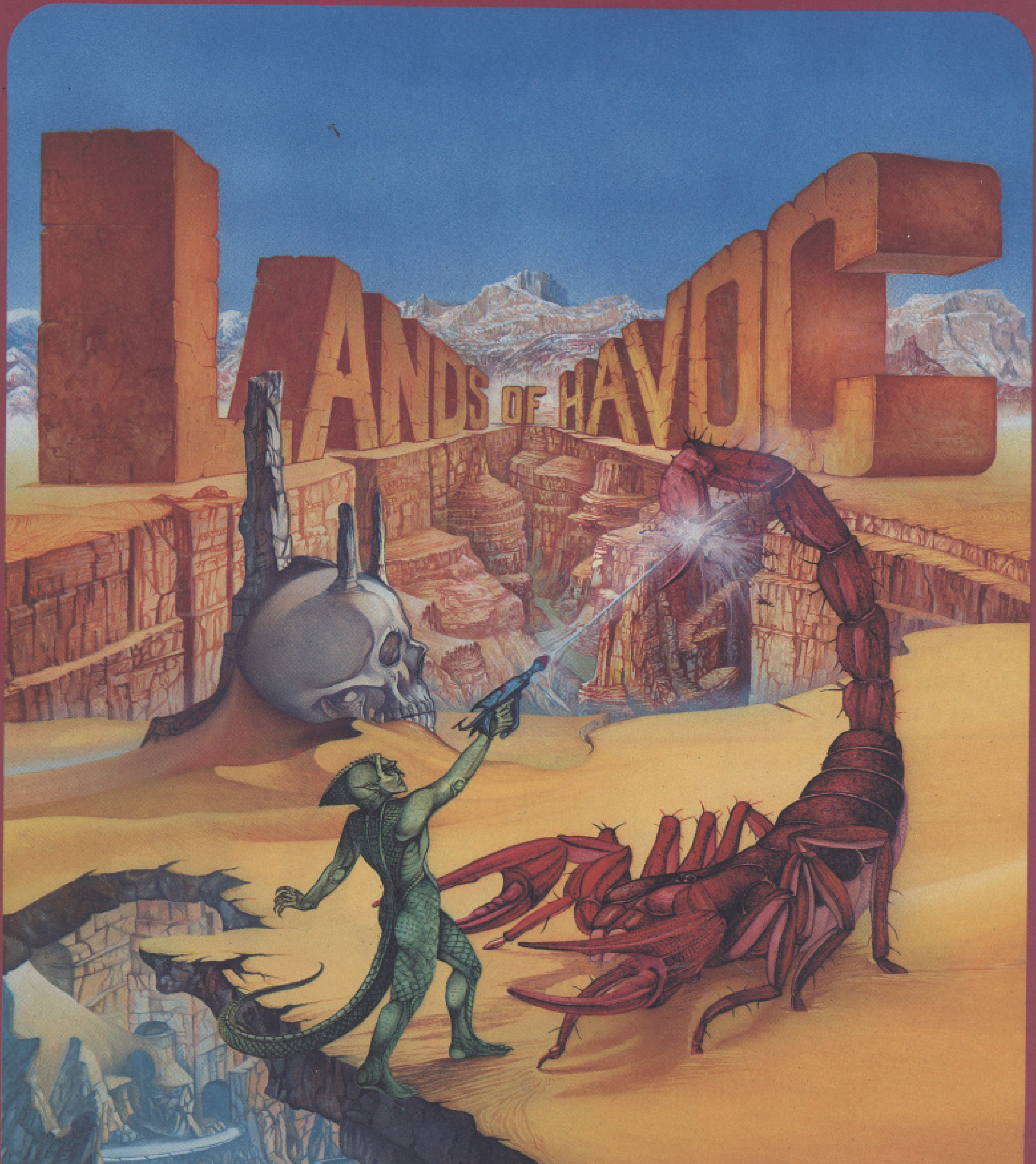
COMMODORE 64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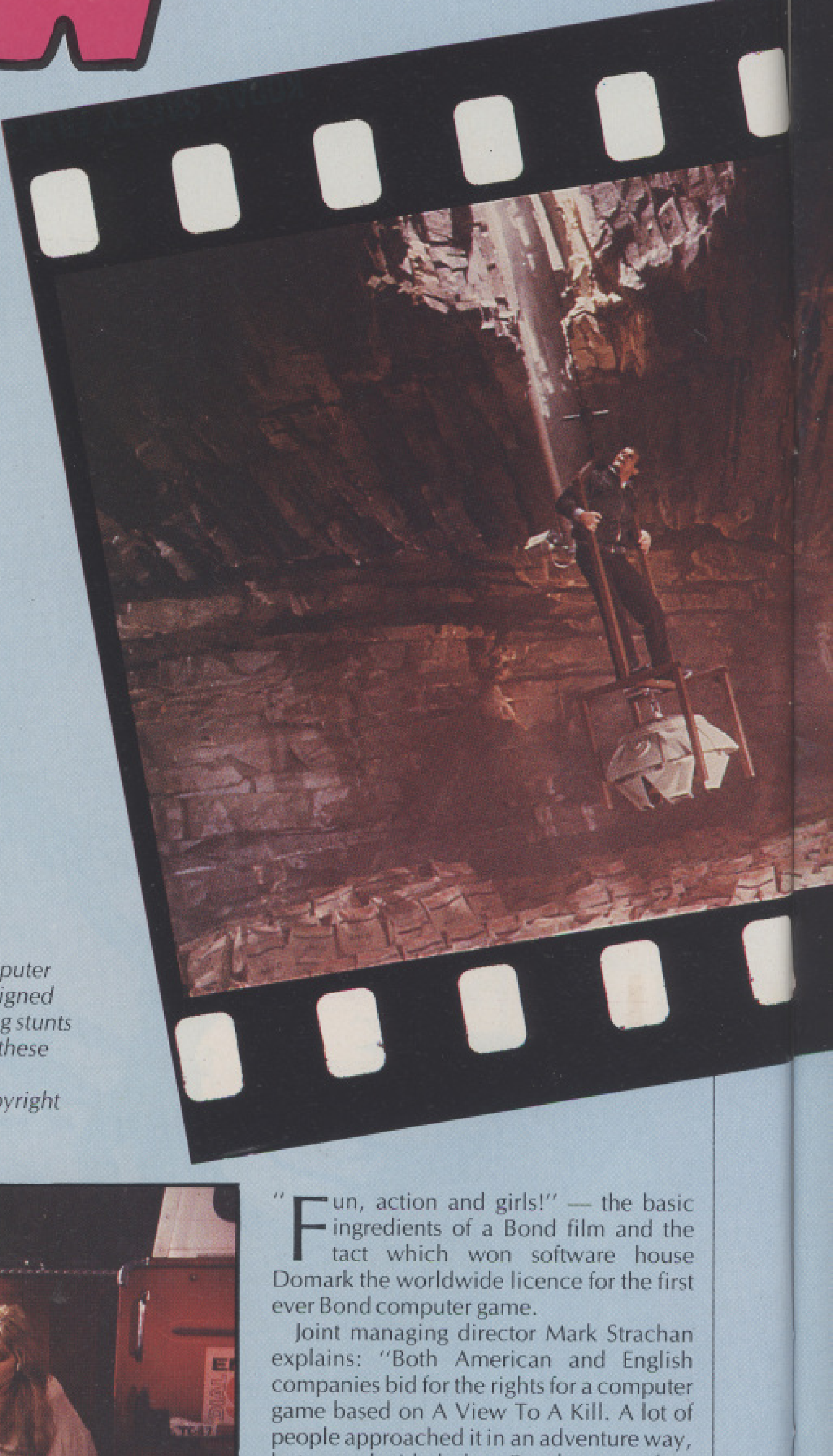


Your name is Bond — James Bond! At least it is in the computer version of a View To A Kill, the first time Bond has ever been the star of a computer game. Sue Pearce talks to Domark, the company which holds the worldwide rights to the game and traces the game from its conception to completion. CCI also took an exclusive look at the game as it neared completion.

The View To A Kill computer game by Domark is designed around the most exciting stunts from the film as seen in these stills.
(All photographs © Copyright 1984 Danjaq S.A.)

"Fun, action and girls!" — the basic ingredients of a Bond film and the tact which won software house Domark the worldwide licence for the first ever Bond computer game.

Joint managing director Mark Strachan explains: "Both American and English companies bid for the rights for a computer game based on A View To A Kill. A lot of people approached it in an adventure way, but we decided that Bond meant fun, action and girls.

"The way we decided to attack it was to produce an exciting arcade game following the film as closely as possible."

After making the initial approach, Domark was given a script of the latest Bond film, A View To A Kill. Design company Speshal K was commissioned to write three games.

This positive approach paid off. While other software houses attempted to outbid

KILL!

each other for the computer rights, Domark was able to present what it planned to do to the Bond agents (producer, publicity people, script writer, etc).

Strachan says: "We were producing something exciting, graphically good, playable and in the image of Bond. We said we would follow the film and that Bond would never die — something they are very proud of."

And so Domark won the contract in February. With a release date of mid-June for the film, A View To Kill, Domark had just over three months to produce a product to be launched around the same date.

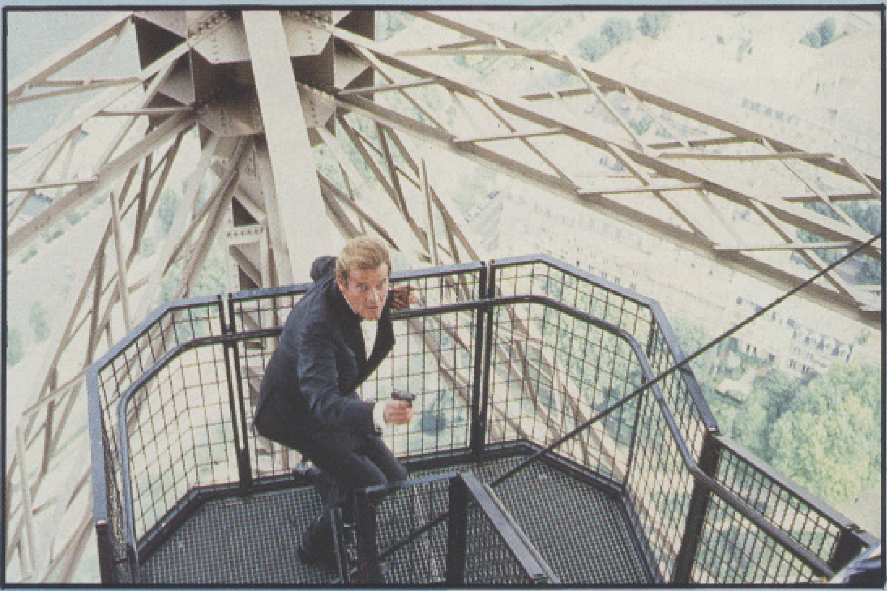
Rather than bringing out just the one game, Domark felt a truer representation of the film could be given by three games designed around the most exciting stunts in the film — all for the price of one!

"We set ourselves a hard task," says Strachan. "If we had just put out one game, it would have been very hard to make it representative. We decided to follow the film and give three games."

As publishers of computer software as opposed to creators, Domark employs experts for each aspect of a game.

Strachan says: "Once we had got the contract, we put out a tender for programming. We saw five or six companies and Softstone were the most in tune with our ideas."

It does seem logical to leave each aspect of the game in the hands of experts, as indeed many software houses are beginning to do, but how easy is it to keep control over a game when you're dealing with games designers, graphic designers, musicians and programmers?



Speshal design for Bond game

Chris Palmer of Speshal K tells CCI how designing the three games which make up A View To A Kill required a different approach.

"We spent a few days down at Pinewood Studio (where the latest Bond extravaganza was shot), went through the script and talked to the people involved. Then we went away and designed the game from that information.

It was an interesting game to design. In most games you are limited to a number of lives — with Bond you know he will never die. We couldn't use usual techniques we usually use.

Also we were trying to work within the strict storyline of the film. In the film you always think he's going to get out of situations.

What we have managed to do is to incorporate the three main game playing areas of a computer game — straight arcade, arcade adventure, and platforms and ladders.

Usually someone will design a sprite or animation and the game will be built around that. With Bond the story came first.

We did have to take some liberties, but rather than leaving out things, we have taken events and expanded them logically. For example, in the City Hall where Bond has to rescue the girl he knows the way out of the building. In the game the player has to discover the way himself.

We tried to think in the same way as the people who made the film.

People nowadays have seen lots of pretty pictures on screens and heard computer music themes. What a player wants now is a good game to retain the attention and to be kept thinking. That is what we have provided with A View To A Kill."

"No human being is a machine," says Strachan. "For example, we gave Softstone a very strict story board. We said, we want to produce three arcade games. The games look like this, but the interpretation is open to you. You know best."

Regular meetings were held and constructive criticism given. Strachan says: "We have planned it so well, that it hasn't required working 24 hours a day, seven days a week."

The games were nearing completion at the beginning of May. There then followed a period of 'putting the icing on the cake' — continuous play testing, improving graphics and adding extras such as sound. Programmer Tony Crowther had done an impressive job recreating the Bond theme on the 64. At the time of going to press with this issue, it had not been confirmed whether Domark would be able to incorporate the title song of A View To A Kill — sung for this film by Duran Duran (a strange choice!).

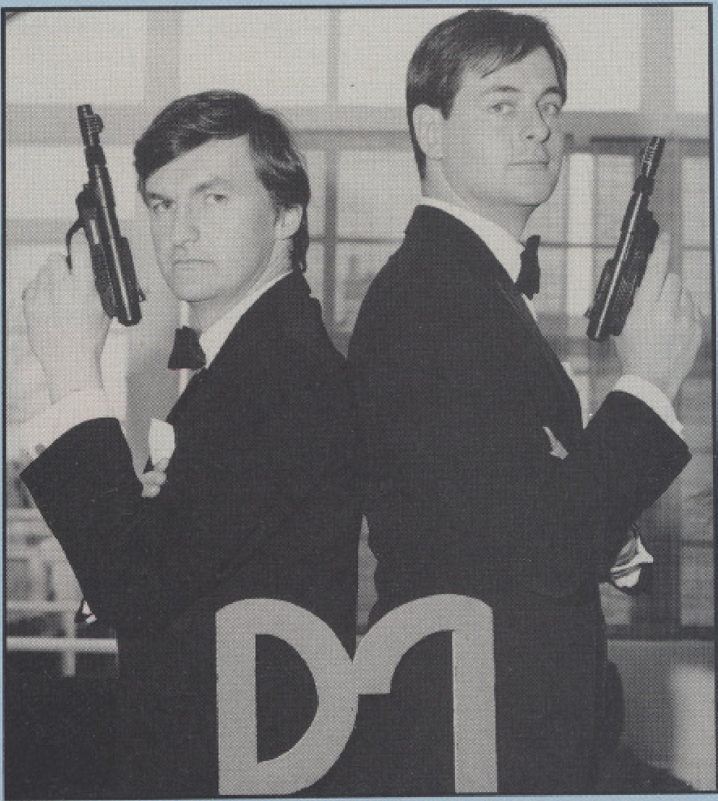
The game has been programmed around the 64, although other versions will be available. Strachan is thrilled with his product.

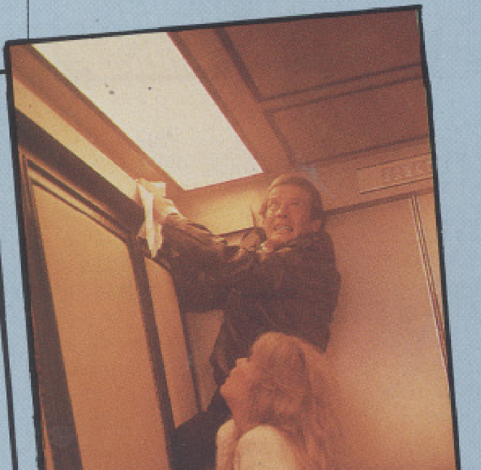
"I am very excited because we have created a fun piece of software," he says.

"A Bond film isn't just a film, it is an event. I am delighted because my product is being launched with an event.

"The time is fast approaching where people are thinking that software is entertainment. Linking software to other packages makes it more exciting," continues Strachan.

"One must never forget that people see Bond films to be entertained. I want everybody to be entertained. With our game, for the very first time they can be Bond."


Domark's Mark Strachan and Dominic Wheatley with A View To Kill



A VIEW TO A KILL

Domark gave CCI an exclusive peek at the pre-production copy of A View To A Kill, so slight changes may well be made. However all the indications are there for a very successful game. Or rather games, as you get three games for the price of one.

Closely following the events of the film, the games are designed around three of the most exciting stunts.

You can treat each game as an individual challenge, or work your way through — although the codes gained through the latter are needed to correctly fulfil your ultimate mission of diffusing a bomb.

An impressive title screen has Bond walking onto the screen in the classic 'through the gun barrel' shot to the accompaniment of the Bond theme. Credits then roll down the screen, reminiscent of film credits.

The action starts in Paris. Baddie Mayday hang-glides off the Eiffel Tower. Your mission, as Bond, is to drive through the streets of Paris in a 'borrowed' taxi to intercept her landing.

This screen is divided into areas. At the top you have a realistic 3D view of the streets ahead (the final version will probably have this view shown through your windscreen with dashboard dials). Underneath you see the maze of streets, some of which are one-way.

Other visuals include an indication of car damage (don't forget Bond never dies) and a bleeper. This bleeper gives you an audible indication of your distance from Mayday. Hazards include police cars which give chase if you go up too many one-way streets — it's fun here to practise your handbrake turns!

The second game, set in the City Hall, has an element of arcade/adventure to it. You've escaped from the lift, but your blonde companion is still trapped and the building is on fire.

Moving round rooms, you must pick up objects. Entirely joystick controlled, actions are performed via a duckshoot of options: search, use, etc. Objects held are also shown in a duckshoot.

Again you see a 3D view of the rooms, and underneath the sight of the entire building being consumed by flames.

The climax is the mine sequence. Evil Max Zorin has threatened to blow up Silicon Valley (he has his own micro area). With the San Andreas fault this would result in Los Angeles and San Francisco falling into the sea.

You move around the mine in search of the bomb by jumping over crevices and climbing ropes. You will find objects to help you, but watch out for flooding. A useful feature here is a pan facility to aid route planning.

As you are Bond in this game, try to think how he would get out of tricky situations. You are not limited by a number of lives — instead you have to complete the game before the bomb explodes.

In terms of graphics and playability, A View To A Kill is a game well-worth viewing. It incorporates many common features of games — mazes, finding objects, platforms — but also contains a lot of surprises. If the pre-production version CCI saw is anything to go by, Domark has a winner on its hands.

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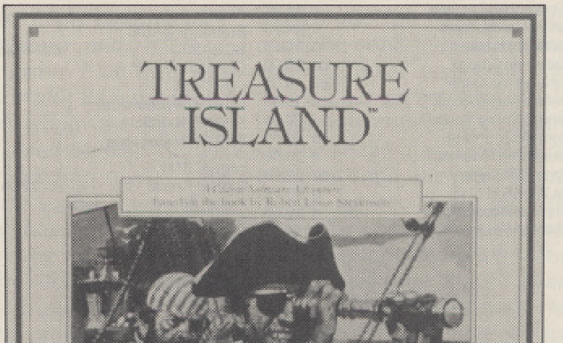

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Computer learning – or is it?

Keeping up with the home education software market can be an exhausting trial. Former teacher and psychology Ph.D. Michael K. Jackman gives the parents a hand with a look at some of the offerings

CAESER'S TRAVELS

This program consists of a number of stories involving Caeser the cat, with graphics and sounds being used to illustrate various parts of the stories. It sells for £7.95 on cassette, £10.95 disk and is intended for 3-9 year olds. It comes with a book of the same stories that appear in the program, together with a number of additional ones.

On loading and running the program you find that Caeser is not very good at catching mice – so his owner throws him out. You are then presented with a choice of actions that Caeser could perform. Once the choice is made, the next part of the story is presented. This in turn leads on to other choices as the story progresses. Eventually, Caeser finds a new home. The overall result is that by making different choices a number of different stories are possible. Choices are made using the function keys. A cardboard cutout fits around the function keys and indicates which keys represent which choices.

Text is presented in the top half of the screen, while the bottom half is used for pictures supporting the story. These pictures show Caeser performing various actions such as walking, jumping, sitting and sleeping, etc.

> **"Develop imagination and thinking processes"**

The program can be used as a source of stories. More interestingly perhaps, the parent can use the stories to help develop the child's imagination and thinking processes. For example, one can ask the child what might happen next and why. Why perform one action rather than another? etc. This requires that the parent be present, but given that a fair amount of reading has to be done, this would be necessary in any case for young children.

Caeser's Travels is an interesting program but I have two reservations. First, the graphics are not the best by any means. Second, I cannot see it appealing to children much older than about 6. Depending on what you need, it is worth a look.

Contact: Mirrorsoft, Holborn Circus, London EC1P 1DQ. Tel: 01-822 3913.

BIG BIRD'S SPECIAL DELIVERY

The program consists of two educational games aimed at 3-6 year olds. It is priced at £8.95 on cassette and £11.95 disk.

Both games make use of characters called "Big Bird" and "Little Bird". Big Bird first delivers a package to Little Bird who than has to deliver this package to one of four shopkeepers. In the first game, the picture on the package to be delivered is the same as the picture on one of the shopkeepers' stores. In the second game, the picture on the package is in the same category as the picture on one of the shopkeepers' stores.

For example, if the package has a picture of a shoe, the relevant store might have a picture of a shirt. The other three stores might have pictures of a car, a house, and a banana. In either game, if an incorrect choice is made, then the shopkeeper to whom the package was delivered shakes his/her head accompanied by appropriate sound effects. The child then has another attempt at delivering the package. When the correct choice is made, there is a different sound effect, indicating a successful delivery.

> **"Simple to operate"**

This game is quite simple for the young child to operate. Only three keys are used – one to indicate movement to the left, one to indicate movement to the right, and a third to indicate that the package is to be delivered. This means that the child can be left on his own to play the game. However, at the start of each game, there is a choice of two levels of difficulty to be made, so the parent needs to be involved to some extent.

The program's main value for the intended age group lies in the notion of teaching that different objects belong to the same category. Nine different categories of 63 objects are used altogether. While this is a sound idea educationally I do have two reservations. First, the graphics could be better; some of the objects I found difficult to recognise. The young child could be confused and get the wrong answer (especially on the second game) simply because they could not correctly recognise the object in the first place. Second, the price seems to be far too high for this particular type of program. Once the various objects in the nine categories have been learnt, and the child finds the task easy, there is no scope for adding new objects or making the task more difficult. If the price were much lower, then it would be worth buying.

Contact: CBS Software International, Ashbrook House, 3-5 Rathbone Place, London W1P 1DA. Tel: 01-734 8181.

DINOSAURS

Dinosaurs consists of software plus a book (called Dinosaur World). The whole package costs £7.95 (cassette) while the book can be brought for just

£1.75. No intended age group is mentioned. However, given the type of book it would seem to be suitable for children of about 9-12 years.

The program starts off by telling you that you are a trainee in the "Piper Academy of Time Travel" (Piper Software being the publishing company). You have four tasks to perform. When each task has been successfully completed you are then a "Time Master".

"Educational value is sadly lacking"

Assuming that the four tasks were designed to encourage learning something about dinosaurs, the educational value of this particular software package is sadly lacking. The first task requires a fair degree of manual dexterity and hand-eye coordination, as well as being able to quickly work out if two numbers add up to 8 or not. This may be mathematics, but it is nothing to do with dinosaurs.

The second task starts off by asking a small number of questions about prehistoric animals. Then a very primitive game follows. In this game you are an amphibian and you are supposed to lead a reptile into either a swamp or a ravine. Again, this is a matter of manual dexterity and hand-eye coordination. The graphics are particularly poor in this game making it quite difficult to differentiate between a swamp and an amphibian.

"Graphics are particularly poor"

Both of these games need to be completed to get to the third game, as "codewords" are needed to get from one game to the next. This raises another problem. If you switch off the computer you need to replay game 2 to get onto game 3 since a new codeword is generated. The third task is simply a matter of anwering a small number of factual questions – for this you would need to have read the book. The job is dressed up in the guise of you being a time traveller landing on an alien planet. The fourth task is simply a matter, again, of having manual dexterity and hand-eye coordination.

Overall, the software is of very little educational value being mainly very simple hand-eye coordination games. If you want such a game then it is better to buy one specifically for that since you will at least get something which requires a fair degree of skill to be developed. On the other hand, the book is quite good. If you want a book on dinosaurs for young children then this is worth considering.

Contact: Piper Software, c/o Pan Books Ltd, Educational Marketing Manager, 18-21 Cavaye Place, London SW10 9PG. Tel: 01-373 6070.

EIFFEL TOWER

This program consist of a number of tests of your knowledge of French words – each test being on a different aspect of French vocabulary. The program seems to be intended for anyone wanting to learn French.

The program starts with the presentation of the menu. This allows you to choose which type of French words you will be tested on.

A test presented in the following manner. A number of dashes are presented indicating the number of letters in the French word which you have to get right on that test. Below these dashes is a clue. In fact, the clue is an English word and what you have to do is to find the French equivalent. If you do not type in the correct word, the correct answer is given automatically. The very same test is then given again. If you continue to get it wrong (which is difficult given that the correct answer is always given afterwards) the same test is continually repeated.

Each correct answer adds pieces to a picture of the Eiffel Tower being built. When enough correct answers have been given the building is finished and the menu is presented.

There is very little educational value in this program. At a cost of £7.95 on cassette, £10.95 on disk it is far too expensive. In fact, in my opinion, I do not see how it is worth buying at any price. You would be much better off purchasing a good French-English dictionary and making up your own tests.

Contact: Chalksoft Ltd, PO Box 49, Spalding, Lincs PE11 1NZ. Tel: 0775-69518.

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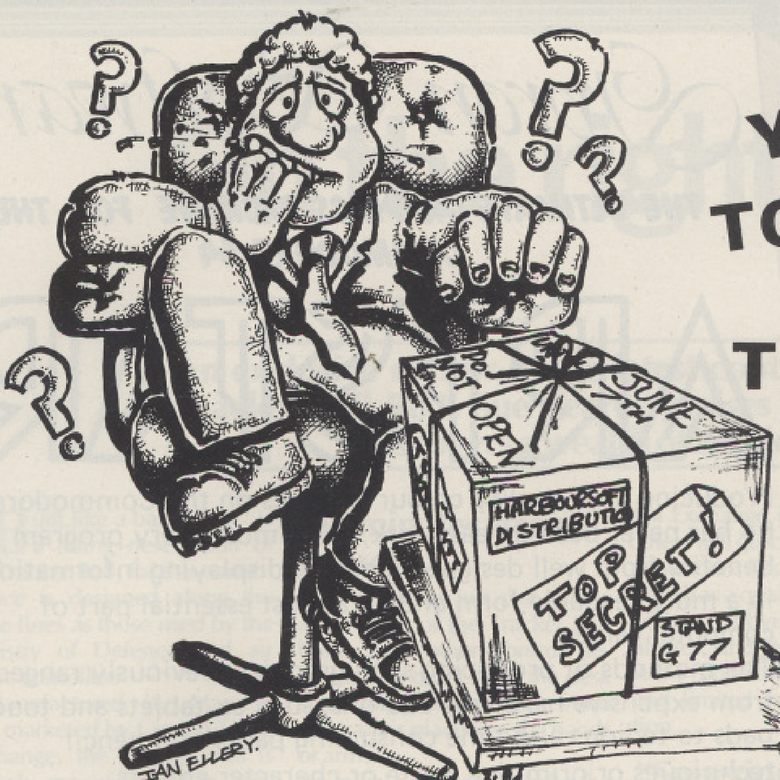

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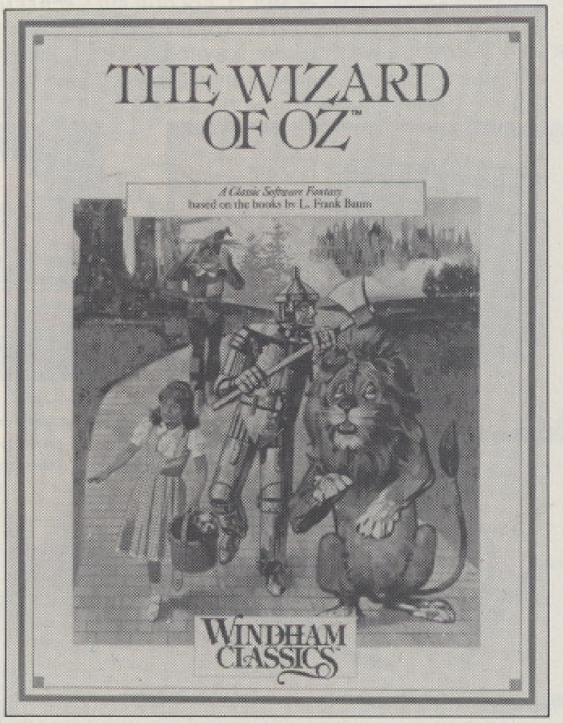
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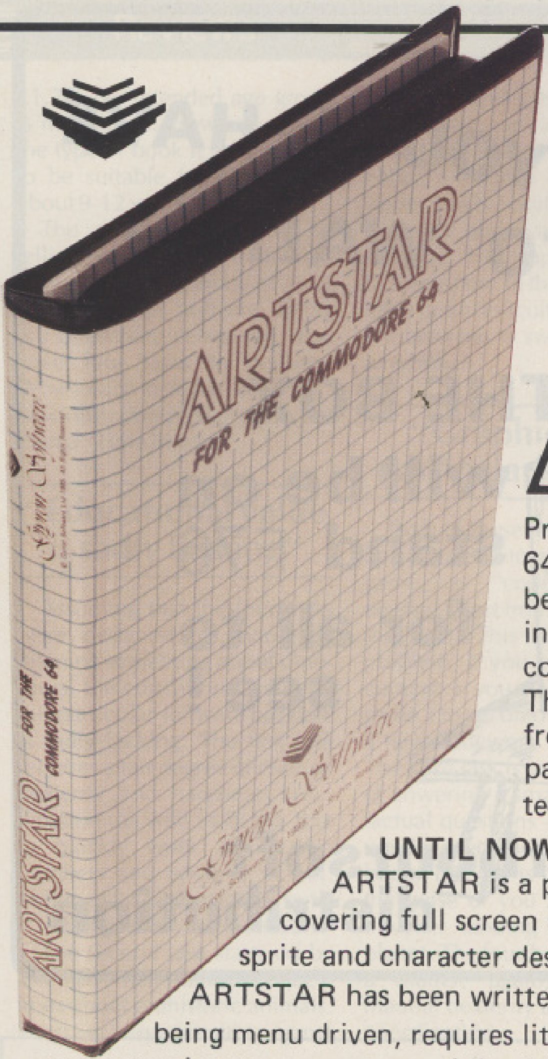
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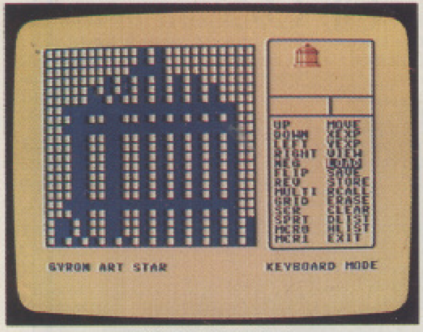
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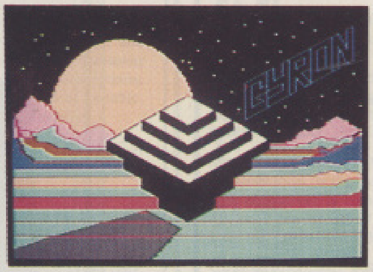

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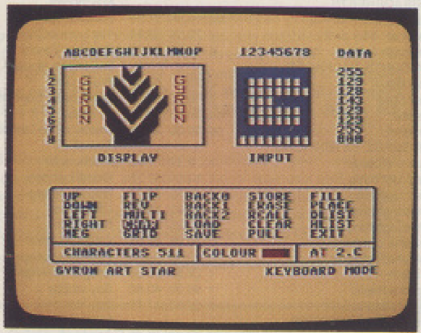
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On the right track

An exclusive review of the latest control technology, the Tracker Ball RB2. Sue Pearce praises its ease of use and discovers a wealth of applications.

"Built like a battle ship" is a fitting description of the Tracker Ball, for this control device is designed along the same lines as those used by the Ministry of Defence and air traffic contollers.

Manufactured by Marconi and marketed by Central Trade Exchange, the Tracker Ball is entirely manufactured in England. A sturdy, yet not unattractive device, the Tracker Ball replaces joystick and mouse controls.

A version has just been released for the 64 and CCI were invited to take a look at the very first unit in the country.

At 59.50, it may be considered an expensive alternative to a joystick, but hands on experience with the Tracker Ball will win you over.

"Fingertip operation"

Unlike joysticks, it is built to last and is repairable. And unlike a mouse, it does not require cleaning.

Constructed of rigid beige plastic, the Tracker Ball is desk top mounted for easy access. Precise X-Y cursor control is achieved by fingertip operation of the central ball. This is remarkably smooth and requires little effort, freely rotating in any direction. There are also three switch buttons at the top of the Tracker Ball.

Central Trade is giving away software with the Tracker Ball. A sprite-based cassette based on Talent's popular Panorama H offers colour graphics. A comprehensive manual is also provided.

In addition to usual features of a graphics package, this software offers a 'zoom' facility enabling the user to work on a drawing one pixel at a time. Also the facility of two screens enables a form of animation.

"Eliminates strain in use"

Ease of use is just one of the advantages of the Tracker Ball holds over other control devices. You don't need the desk space that a mouse requires and no strain is placed on the hands or arms.

An initial drawback may be the shortage of Tracker Ball controlled software currently available. However some software houses are already modifying and writing software and Control Exchange is confident that others will quickly follow suit.

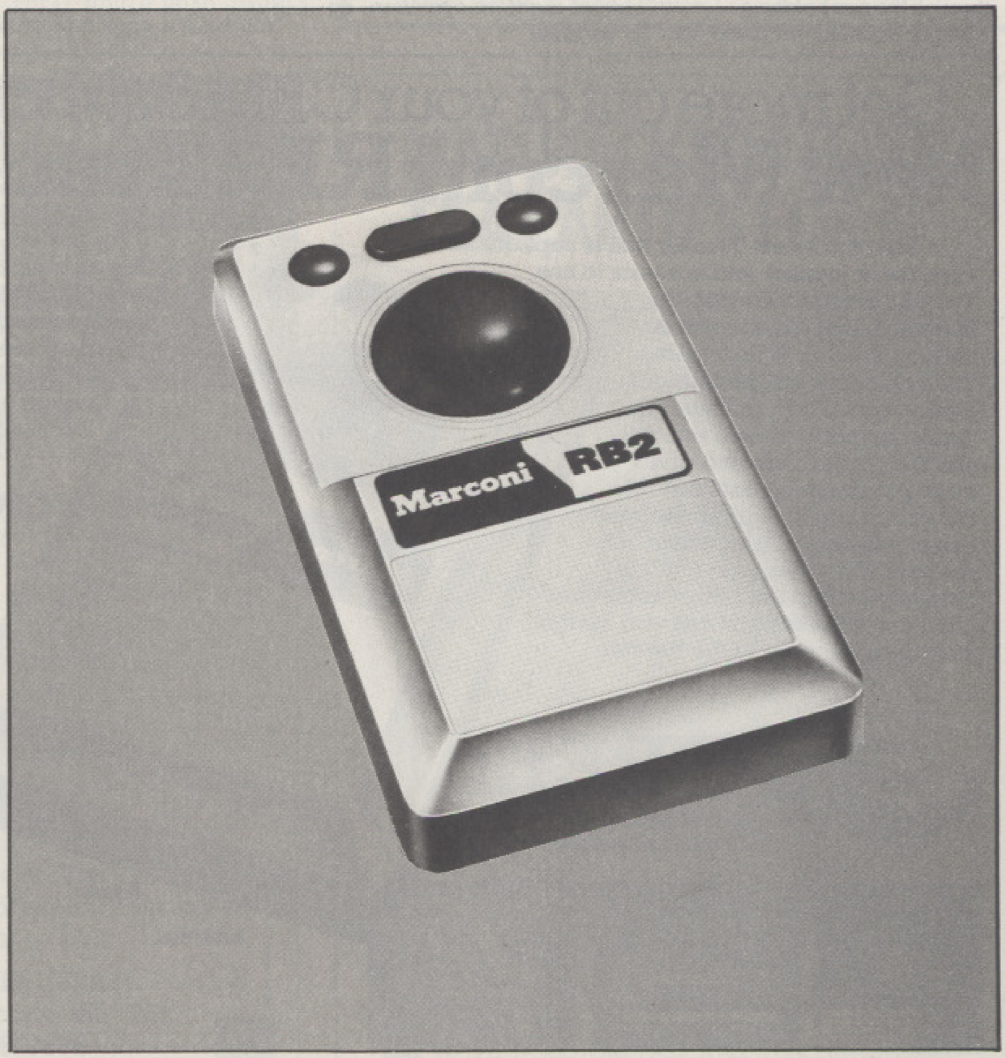
Marconi designed the Tracker Ball as a quality device for the serious hobbyist, for educational uses, and for low cost CAD/RAM applications is endless and limited only by imagination.

"Superior control"

An important market must surely be handicapped people with limited movement. The Tracker Ball's control ball rotates so freely that it could easily be operated by any part of the body.

It also enables superior control in games. After all, if air traffic controllers trust this control device to guide aircraft successfully, you should feel more confident in your computer game battles!

Contact: Central Trade Exchange, Aston Lodge, Ashtan Road, Dunstable, Beds LU6 1NP. Tel: 0582 64334.



Graphics made simple

Sue Pearce finds Anirog's Super Sketch graphics tablet the ideal tool for beginners.

Graphics packages for home computers, such as the 64, come in all shapes and sizes. Anirog has produced a package which is well-suited for the newcomer to computer graphics.

Called Super Sketch, it comes in the form of a graphics tablet, a sensing device which electronically senses the movement of the control arm and translates that movement to the television or monitor screen.

Setting up is very straightforward, all you do is plug the cord from the graphics pad into control port (joystick) 1. Software is available on disk (£51.95) or cassette (£49.95).

The Super Sketch tablet is constructed of rigid white plastic. A clear plastic control arm moves the pen holder around the tablet. You can place a pencil or other drawing utensil through the pen holder.

Paper is held in place by clamps which are released by the release bar at the head of the tablet.

> **"A starter kit helps you explore the package"**

Anirog has thoughtfully included a Starter Kit — a collection of line drawings which can be held in place by clamps on the tablet. This is very useful to help you explore the many features of the package.

From the main menu you select the required option/colour by moving an arrow down with the control arm and then pression the button marked Select. Lift exits you from the menu. A cursor designates the spot where you are drawing. Under this you will see a letter indicating your current mode of operation, eg 'd' for draw.

Pressing the Lift button (there are two — catering for both left and right-handed people) enables you to move the control arm without drawing on the screen, or to return to the drawing from the menu.

Pressing Menu stops on-screen activity while the menu appears on the left of the screen.

The many features include: colours, clear, draw, swap (to change a colour on a drawing), fill, eraser, undo (returns screen to last condition on leaving menu mode), page 1/page 2 (for independent drawings), expert (which leads you into a further menu for rays, circles, etc).

> **"The list of features goes on and on"**

You have a choice of brush and a choice of design. The list goes on to cover all the elements required to produce quite spectacular pictures.

In the expert mode you can save or load your works of art very easily. The program even formats your disk/cassette for you.

Super Sketch contains all the options you could ask for. I particularly like the H and V commands which draw horizontal and vertical lines on the screen — freehand straight lines are not the easiest thing to draw.

Another advantage of a graphics tablet is that you can rest it on a desk top or even on your lap for comfort, whereas when using a light pen your arm tends to tire very easily.

Contact: Anirog, 29 West Hill, Dartford, Kent DA1 2EL. Tel: 0322 92513

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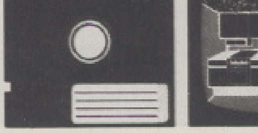

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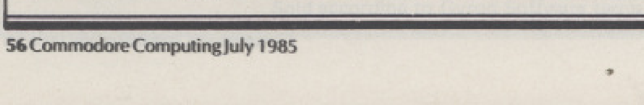

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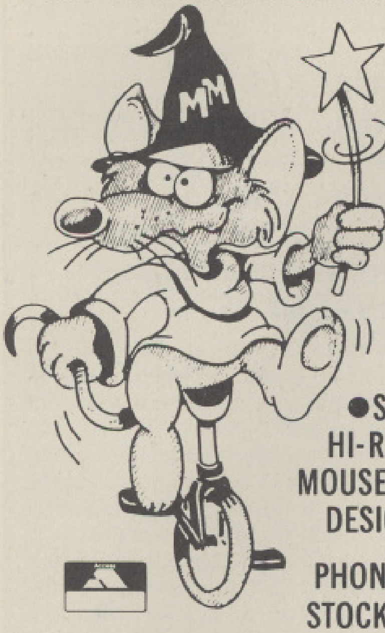

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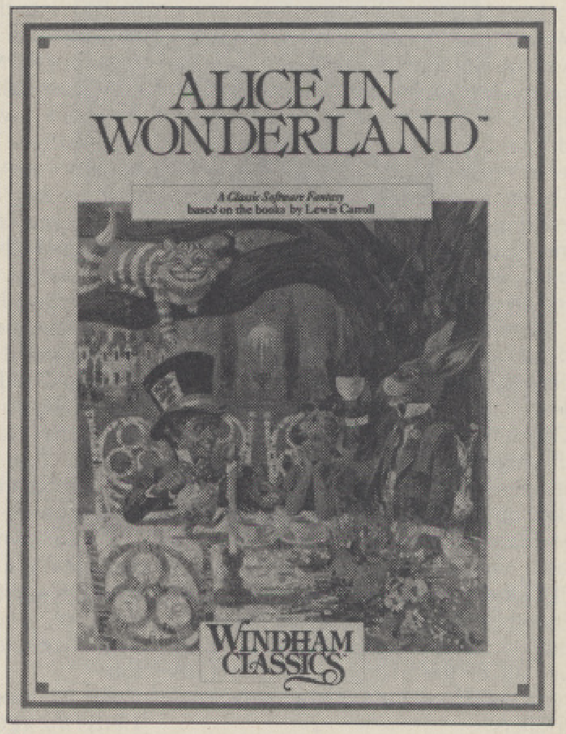
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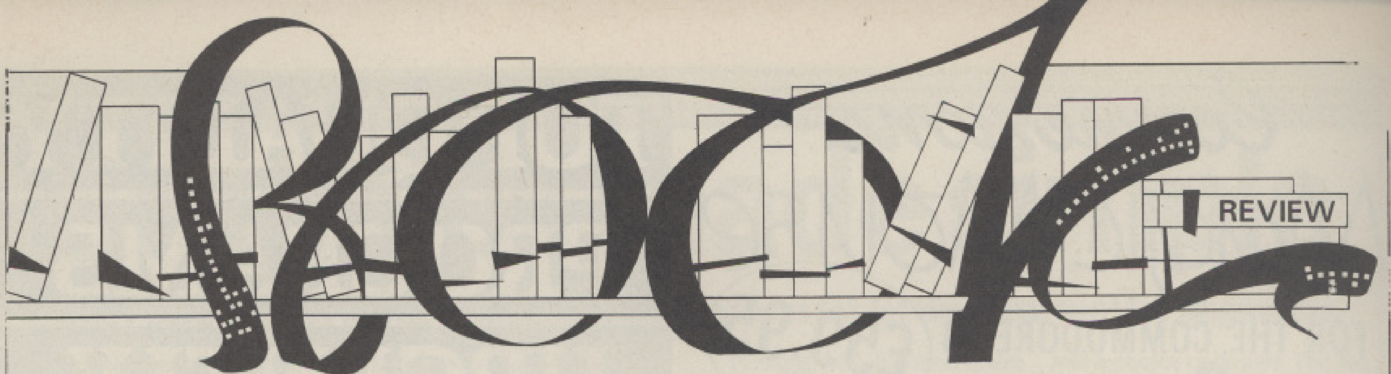

INSIDE COMMODORE DOS by Immers R. Neufeld — £22.95.

Until now, for most of us the 1541 Disk Drive was the clever beige box which cost an arm and a leg and served as our data bank. Other than the information and commands given in the abysmal handbook supplied with the drive, for most of us the thought of direct access programming was inhibited for two significant reasons. The first being wiping out the disks and the second being causing damage to the drive itself since it does represent some high precision engineering which is reflected in its price.

Six months ago there emerged several books on OPERATING the drive and, until the appearance from Germany via the USA (where else?) of the "ANATOMY OF THE 1541" in the autumn, the innards of the unit remained a mystery. This book gave us a foretaste of what was to come. Although ANATOMY gave us a ROM listing, it really only scatched the surface. This new book INSIDE COMMODORE DOS get down to brass tacks.

The book itself consists of 508 pages, is well indexed and will probably be the most expensive addition to your library yet. Depending on the retailer the cost will vary between £20-£25, however just a fleeting glimpse inside will hook you into buying. There is a bias towards the 1541 although the other Commodore disk drives are not ignored. Best of all are the program listings for the Commodore 64, more of which later. With nine chapters and four appendices to get through, my interest never flagged.

The first five chapters are consolidations of existing published knowledge, although some helpful snippets such as the unreliability of the "B-W" block write command are given. Perhaps more usefully we are informed why this is so. I also like the end of the chapter summaries which effectively act as an extention of the main index.

Chapter six is where the meaty bits start, with programs to operate the drives read/write head from the keyboard, the data picked up being output to the screen. The next chapter has been named a "software pirates dream" by fellow member of ICPUG the redoubtable Jack Cohen, and I do not think he was very far off the mark. Even if the error creation programs do not cover all of the anticopying techniques they provide food for thought to crack the real killers.

This brings me to an interesting commercial point on disk protection. At present there is a great deal of controversy raging in the pages of the American magazines on the ethics of disk protection. My own view is that if a supplier wishes to market protected disks then he should also supply a backup disk AT NO ADDITIONAL COST to the purchaser. Most of the professional software supliers do this already (eg Commodore), presumably on the basis that the vast majority of buyers only ever bother to attempt disk copying if they have no backup disks. The floppy disk ia inherently more vunerable to accidents than tapes and most of the high quality PC programs such as dBASE are not copy protected. However, I would imagine that the publishers of this book have been deleted from a few Christmas card lists!

The chapter also introduces us to the intracies of the Commodore data encoding scheme. This uses the GCR (Group Code Recording) method which is also employed by APPLE. Unfortunately most disk systems use the FM (Frequency Modulation) technique originated by IBM, which explains the incompatibility of Commodore (and Apple) disk formats.

Chapter eight revolves around disk recovery methods, whilst chapter nine takes us right into the drive itself. There is even an additional section on late (1984) news regarding ROM changes and patches.

At least half of the book is taken up by Appendix A which is the ROM source code for the 1541. This really should be read in conjunction with the ROM disassembly given in the "ANATOMY OF THE 1541". The source code also has accurate comments and other than a few minor errors is well covered. But for most of us the jewel in the crown has to be the programs in the text. I have tried virtually all of them (some are expanded versions of earlier listings in the book) and have nothing but praise for them. You do not even need an assembler since they are all in BASIC, although source code is included as an option. These programs represent the most powerful disk utilities yet published.

If you own a Commodore disk dive, specifically a 1541 then this book is an essential addition to your shelves. I tend to think of it as the 1541 Programmers Reference Guide, and I am sure you will too.

Contact: Prentice Hall, 66 Woodane End, Herts HP2 4RG. Tel: 0442 58531.

Bill Donald

THE HACKER'S HANDBOOK by Hugo Cornwall — £4.95. THE HACKER'S HANDBOOK by Geof Wheelwright and Ian Scales — £4.95.

No, there hasn't been a mistake. There really are two books published at around the same time with the same title. In fact there are really four books around with the same title since the second book, published by Longman, is specifically for the Commodore 64 and is accompanied by others for the BBC and 48k Spectrum.

It's the first book, published by Century Communications, that's received all the publicity but Commodore 64 owners, if faced with a choice of one or the other, will probably plump for the Longman book. The Century book is really about hacking while the Longman book tells you how to hack. In other words only the Longman book is really a handbook which contains the sort of detail you would expect to find in a handbook.

In some ways the pseudonymous author of Century's Hacker's Handbook would be justified in complaining that his book is a 'how to' book. But his 'how to' is much more general. Rather than telling you how to connect up the modem to your computer Hugo Cornwall (Igo Devon?) talks about hacking techniques — cracking passwords, finding telephone numbers and so-on. If you define a hacker as someone who breaks into computers The Wheelright and Scales book is not, strictly speaking a book for hackers. It deals entirely with the legal side of computer communications and skates around the naughty things that hackers get up to.

In contrast, Cornwall revels in the 'naughty bits'. Comparing the two books is rather like comparing The Lancet with Knave. As a medical journal The Lancet might take a serious, practical approach to sex. Knave's approach is that of the sniggering schoolboy for whom sex is a dirty joke and who is just a little bit worried about going deaf.

Hacking is like that. Great fun, largely irrelevant, quite trivial, daringly titillating and, like many games, pointless. It is also illegal. But is it Wrong? Hugo Cornwall doesn't seem to think there's anything wrong with it at all. I suspect that on the whole hacking is usually wrong. The generalisation reflects reservations I have about the wrongness of hacking. Some of those who work closely with computers are also concerned about how computers might be used — or abused — in the future. Computers open up whole areas of new opportunities — for misuse and for cock-ups. Hackers help to remind everyone that computers are only machines and that they can be misused.

Lock something away and someone will want to get to it. It's generally acknowledged that your average home cannot be made absolutely secure from intruders. Indeed, any security system made by man could eventually be cracked. Personally, I'd feel a bit peeved if I came home and found a stranger sitting in my armchair watching my telly. If his reason for breaking in was to show me that my house could be broken into I wouldn't offer him a drink and ask him to stay for dinner.

What is the biggest deterrent for criminals? The problems that need to be overcome when committing a crime? No. The real deterrent is fear of getting caught. If you could guarantee that anyone breaking into your home would get caught you could leave your front door open.

Contact: Century Communications, Portland House, 12-13 Greek Street, London W1V 5LE. Tel: 01-434 4241.
Contact: Longman Group, Longman House, Burnt Mill, Harlow, Essex CM20 2JE. Tel: 0279 26721.

Computer journalist Peter Arnott-Job evaluates a selection of newly-released computer books.

THE COMMODORE 64 TRIVIA DATA BASE by James F Hunter and Gregory L Guntle — £7.95.

The title, together with the sub-title: Data Base and Trivia Game, just about sums the book up. It offers analyses and explanations of the program listings for both cassette based and disk-based games similar to Trivial Pursuit. The game itself tests your knowledge of useless information.

The book is useful. It teaches the reader a great deal about databases and how they work. At the same time the reader learns a great deal about programming — not necessarily about Basic but about programming techniques. A fair knowledge of the Commodore 64 version of Basic is assumed. The text is clear and lucid and should present no problems except to the absolute beginner.

The programs themselves are not as long or as complicated as you might expect. There are two listings for the cassette game and two for the disk game. The first listing is the database and the second is the game. You can key in your own questions and answers which means that if you want to play the game you'll need to have a bad memory. Wait a minute. Doesn't the game depend on you having a good memory? The program loads a random selection of questions each time you play the game but even so you'd be better off getting friends to key in questions too.

Contact: Pitman Publishing, Southport PR9 9YF. Tel: 01-379 7383.

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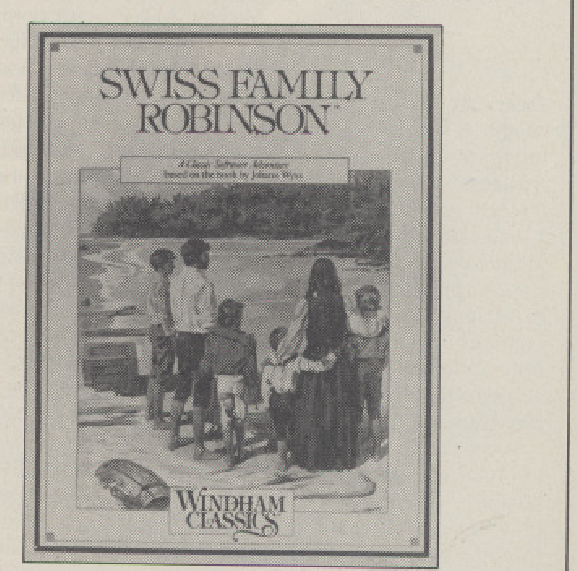
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Letters

This month your letters are answered by Rae West. Rae is the author of three large reference books on Commodore computers; the latest is Programming the Commodore 64, following Programming the VIC and Programming the PET?CBM.` All are published in the UK by Level Ltd. Rae is also published in the USA by Compute! Books.

* * *

Dear Editor

One of the most common and frustrating faults with the Commodore 64 system is loading problems with the C2N tape deck. Users may frequently find that a tape will not load on their own system but will on someone elses. The reason for this is that the tape deck is set up in production to accommodate a data transfer rate of 300 baud, but currently much of the software is designed to run at 1200 or even 3000 baud and at this rate the alignment angle of the head to the tape is critical if a clear signal is to be transferred to the computer.

I have recently solved this problem by using the newly developed Azimuth Head Alignment Tape marketed by Interceptor Micros. The process can be done in a matter of minutes. A superb game on the reverse side of the tape loads at 3000 baud and gives a final accuracy check.

Michael A. Jay
Solihull
West Midlands

Dear Rae,

Might I, through your columns, draw attention to the law with reference to Business Computer Maintenance Contracts.

In a fast-moving scene some dealers are likely to go out of business and failures are now surprisingly frequent at a rate we find of at least one a week. A maintenance contract may in law be an "insurance policy" when a lump sum is paid in advance to cover unforseen events such as breakdowns.

Some dealers do not realise it is a criminal offence to carry on an insurance business without authority from the Department of Trade and Industry given only to companies with adequate assets and a proper margin of solvency.

In effect, insurance — it could be described as reinsurance — is required. Recently our High Tech Insurance Department began to provide this form of cover to dealers throughout the UK.

Business computer users contemplating paying a large sum in advance should make sure that the contract is insured with an authorised insurance company. If not, that the organisation offering the contract and taking the risk themselves has adequate assets to meet all its possibly numerous contractual obligations. Their last balance sheet should be examined.

Andrew N Paddick
Director
Wigglesworth (Insurance) Ltd.
London

Dear Rae,

After reading the reviews by Sue Pearce in the April issue of CCI on Micro Illustrator and Tony Hart's Art Master, I felt I had to write and defend the latter. I have both packages and I would put Tony Hart's Art Master at the top. Firstly, you can't use the pictures created on Micro Illustrator in your own programs. They can only be re-loaded into the main program. This is a common feature of a lot of graphic packs around and I find it most infuriating.

No matter how well laid out and no matter how many features a package has, and MI has a lot, it is no good if you can't do detailed work or spend enough time and physical effort to create anything of any value, especially if at the end of it you can't do anything with it except load it back into the main program and look at it.

H M Radwan
London N7

Dear Rae,

I wonder if you can assist me with the following problem?

The company that I work for, which is not computerised, in any way, has asked me to look into the possibilities of using my own home computer, a Commodore 64, for the following task.

We have a fleet of about 40 vehicles and wish to be able to work out, on a monthly basis, the mileage and MPG attributable to each of them. It is hoped that this would be possible using the information shown on our various petrol account bills. That is to say that by inputing date, vehicle registration number, litres/gallons purchased and vehicle mileage reading, we would be able to obtain vehicle registration number, total mileage, average MPG/MPL.

At the time of writing, my system comprises CBM64, CBM1530 cassette unit and CBM1701 colour monitor. Unless it is suggested otherwise I would intend adding the following to complement the program proposed above: CBM1541 disk drive and either CBM MPS802 dot matrix printer or CBM DPS1101 daisy wheel printer.

In respect to the above, can you tell me if any standard software exists that you can recommend (and if so at what price?) or am I being too ambitious for something like this to be applied. Alternatively, is there any help available for computer illiterates like myself with regard to custom made programs?

S N Harper
Romford
Essex

CCI knows of no ready-made software specifically for this purpose, but a solution is actually quite simple and well within the capabilities of a 64. The easiest way to do it is to store the registration numbers as DATA statements, and read these into an array at the start of the program. In effect, the vehicles would then be numbered, say 1 through 40, and a corresponding array would store mileage figures, fuel consumption to date and fuel purchased at the last occasion. (I think these last two figures are necessary — to allow for the fact that mileage corresponds to the fuel already used, not to the latest recharge.)

The figures would have to be written to disk each time); the easiest method would be to write them as a serial file, and read the entire collection of data back into the machine at the start of each run. However, a tape file could also handle this. I imagine timing wouldn't be a problem.

Dear Rae,

I have an unexpanded VIC 20 at home. Because of this I buy your magazine for information and programs, but your latest edition gave me the same problem as before.

I typed in most of "Boris The Brave" from your April 1985 edition. Just over halfway through line 5450 my computer ran out of memory. If the programme was meant for the unexpanded VIC like mine then why was it not split into different listings like other programs, but if it is meant for the expanded VIC then why does it not say so. I have met this problem many times.

I would just like to add that in my town at least there is a large (and growing) selection of software, some of which cannot be found on the 64.

D Scott
Thetford
Norfolk

CCI apologises for the inconvenience caused by this oversight. The listing is, indeed, designed for the VIC-20 + 8k or 16k, with the POKEs listed at the beginning used to reconfigure the machine.

Do you have a computing problem, or advice to offer other readers? Write to us at:

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Finsbury Business Centre,
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Please do not send your SAE's as it is impossible to reply personally to every query.

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"The game of a lifetime" ***Zzap! 64. May 1985.***

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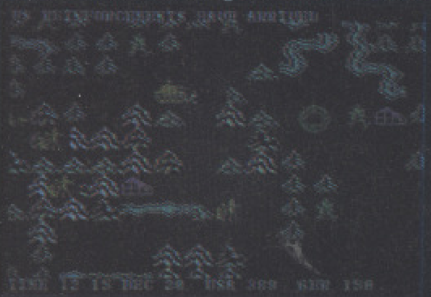
Battle

Wargaming is not as simple as just charging onto the battlefield. Aviation historian Michael Fopp looks at four of the newest computer battles.

> "Who could answer 'What if?' questions"

I have little doubt the original plan for the deception by the Greeks on their arch enemies the Trojans was planned by the Greek Generals on the beach a few miles from Troy. It takes little imagination to picture a group of those resolute and frustrated soldiers standing in a circle sketching their plan in the sand with a stick.

Napoleon probably sat in a tent the night before the Battle of Waterloo and browsed over his maps with his commanders speculating what the next day would bring. During the Battle of Britain, Lord Dowding could tell when his enemy was amassing on the other side of the Channel as a result of that most impressive invention, RADAR: but he could not ask all the questions he wished for who could answer his "What if . . .?" queries.


US REINFORCEMENTS HAVE ARRIVED
TIME 12 15 DEC 24 USA 389 GER 158

Computers have changed all that. Their ability to make complex calculations at great speed allows the Commander to try out his proposed move as a simulation first, trying option after option without moving one man into battle. When the most viable opportunity presents itself he can then make a considered judgement. This is wargaming at its ultimate level.

The practice of wargaming as a hobby has been around as long as the necessity of planning the real thing. Roman archeological digs have shown us that toy

e Cry!

soldiers are nothing new. Children have been playing war for thousands of years; the computer has merely given this hobby a further dimension. It enables the player to undertake a more complex game than could ever have been possible before.

"Wargaming at its ultimate level"

Wargaming is not just a hobby of home computer users. Modern day strategists rely heavily on mainframe and micro computers to test out their theories in a safe environment. Let us consider the planners at the Pentagon or Ministry of Defence; they are now able to fight wars, big or small, conventional or nuclear, with or without chemicals, in any part of the world from their office desks. I am sure that one of the single most contributory factors to our past forty years of (relative) peace has been that both the super-powers are quite able to fight each other every day of the week on their sophisticated computers and, having done so, see that neither side would really win.

Wargaming on this scale has unlimited applications but lesser, more isolated subjects, are being used by people in different walks of life every day. The modern flight simulator is a development of the old type of wargame. Some military flight simulators are actual wargames and carry the simulation further into conflict situations. The pilot is set the task of not only flying the aeroplane but also making decisions regarding attack, electronic counter measures, and evasion procedures. He is placed in a war by software, built into his on-board computers and set-up for him by controllers on the ground. He can then be marked according to his performance and his whole flight reviewed on the ground to pick out any errors. Aircraft are not alone in their use of computers for wargaming; each branch of the military uses them for similar functions.

The use of a board in wargaming replaced the stick in the sand at some stage and since that time the hobby has really been active. Modern computer wargames are predominently adult but the addition to software lists of wargames with an arcade-type element is changing this; more youngsters are being introduced into the subject for it has become visual in a way that they can understand and enjoy as a game, not a 'science'.

I have chosen four quite new programs for the purpose of explaining how this change has taken place. These four illustrate the different ways the principles of wargaming have been applied by the software houses and also their own understanding of wargaming. Only three of the four appreciate exactly what a wargame is, the fourth has used the term but in a context of describing an arcade game that relates to war. Let me deal with this one first for it will be the briefest of all!

"Arcade game that relates to war"

It is called *Operation Swordfish*. As commander of a U-Boat you control the periscope sight for submerged use of torpedoes and a gunsight for surface attack with guns. The period is 1942 and the Allies have planned an invasion "on the Mediterranean Coast." The invasion fleet and supply convoys are your targets and each is protected by torpedo-carrying Fairey Swordfish biplanes. Your mission is to stop these ships from reaching their destination, made difficult because you can only dive to periscope depth as a result of damage caused to your U-Boat during a previous engagement. The scenario is simple; ships pass in front of your sights and you may shoot guns or torpedoes at them depending whether you are on the surface or submerged. The more successful you become, however, the more difficult the task.

Occasionally a squadron of Swordfish is sent to locate and sink you with their torpedoes; you must surface and shoot them down with your guns or they will eventually get you. This program is produced by British Software (£9.95 cassette, £11.95 disk) and their box art-work has the statement "For the first time a team of Britain's best programmers have united to bring you the ultimate WAR GAME."

Cry Havoc and let loose the dogs of war

In the sense of wargaming as I have already described and which is perpetuated by the other three programs, this is not a wargame. In my opinion war games must be well researched and based on fact. The whole point of this program, and indeed its title relates to carrier-borne aircraft attacking a submarine time after time with quite a good chance of success. The "Stringbag," as the Swordfish was affectionately known, was deployed mainly to attack surface ships and was not a spectacular "sub-hunter," certainly not in the way depicted in this program. Also its participation in the Mediterranean theatre, whilst heroic, was certainly not as depicted in *Swordfish*.

> "Must be well researched and based on fact"

It is not really possible to take this program seriously for it is an arcade game, and not a bad one at that. A sort of space invaders with ships! As such it can never be a wargame in the serious sense, but if you are after a game which is well written as nothing more than a game based on tenuous facts and requiring some skill with a joystick and fire-button it is pretty good.

The other three programs are real wargames and each has been written with the serious wargamer in mind. That is not to say that they are unsuitable for those of you who do not like wargaming; that is one of the benefits of the computer. What had seemed to many people as boring and overly complicated board games a few years ago have transferred ideally to the computer and are now easier for those who did not like the complexities of the old-style games. These three deal with ground forces moving over land; one is based on fact, another fiction and the last has a look to the future.

As its name implies *The Bulge — Battle for Antwerp* from Lothlorien (via Argus Press Software Group) priced at £9.99 cassette is a faithful representation of the last great battle of the Second World War. I have come to expect high-quality programs from the Lothlorien stable and this is no exception. The documentation accompanying the program gives a succinct and accurate resume of the events leading up to Hitler's last real try to stop the advancing Allies. In December 1944 he attacked between the British and American armies in the Ardennes in an attempt to split them and advance on Antwerp.

It was a brave move and an ideal subject for a wargame; it was bold and relied heavily on the tactical decisions of individual unit commanders. The weather also played a crucial part for the Allied air forces had almost total superiority. German objectives, such as fuel supplies, had to be acquired within a specific time scale, so the game already has elements that must be completed in order to guarantee any chance of success.

We all know that the German Army was eventually driven back to the start-line by 29 January 1945. The super thing about this program is that for the adventurous among you there is the chance to change history. It is conceivable that, as the German Commander you could actually take Antwerp and succeed in Hitler's objective. All three of these games are operated in the same way. On the screen is a map and symbols for the units displayed. A box-type cursor moves according to keyboard or joystick commands. By placing the box over the unit you require to access you are either asking it for information about itself or about to issue orders for its movement. In *The Bulge* there is also constant intelligence information coming onto the screen in true teleprinter style (complete with sound); intelligence is vital and you are cautioned to watch for weather condition changes and other important events. You are also able to monitor your attack as the units you are commanding send regular situation reports back to you.

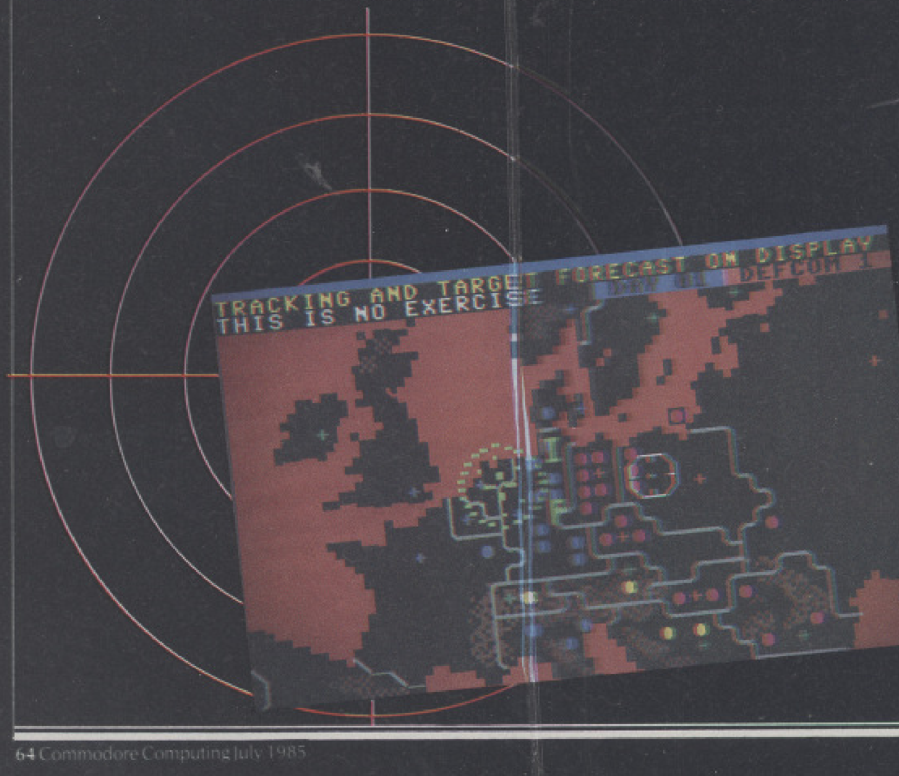
> "A chance to change history"

As with all these games you must always bear in mind the composition of the units under your command. It is pointless sending unsupported infantry against armour, and you must keep a line in some form of order, for if you move some units and not others you may leave the enemy an ideal situation in which to out-flank you.

Lothlorien are to be congratulated on this fine program and it is excellent value for money. I am slightly concerned that Lothlorien are "hooked" on this type of game and may not be bold enough to break away. Their standards are high but *The Bulge* is very similar to their previous games, particularly *Paras* and *Special Operations*; only the fact that they have used a real situation makes this program different enough to be of interest. I would caution them to come up with something really new next time. *The Bulge* is good but you can have too much of a good thing.

Operation Whirlwind by Ariolasoft is a fictional game which places you in a war situation which could be anywhere in the world. You have a scrolling map display which is common to all wargames and the terrain is clearly marked with symbols to signify various obstacles and other details relating to the area you wish to conquer. Your task is to advance over enemy territory, attack enemy patrols and eventually break through enemy lines and force a general retreat.

The game is similar in its operation to *The Bulge* but the movement of the command cursor was very slow. The result of this simple deficiency is that, to the average non-wargamer, things will not happen quickly enough. This is a pity for it seems to me that if a program that has elements of sophistication within it cannot be speeded up then there is something wrong. All the other games reviewed were fast and responsive. *Operation Whirlwind* was cleverly put together and its instruction book, whilst


TRACKING AND TARGET FORECAST ON DISPLAY
THIS IS NO EXERCISE
DAY 01
DEFCOM 1

brief, was easy to understand. However, it does not shine out as being anything but an average program and in comparison to *The Bulge* is really not worth the money. It costs £11.95 cassette, £14.95 disk.

Once again you are in command of an infantry battalion; your job is to smash through enemy lines, mop up any resistance you may encounter and secure the town at the edge of your scrolling map display. You are opposed by the computer which has at its command a "rag-tag mix of infantry and armor (sic), all bent on stopping you." As you advance you are harassed by enemy mines and long range artillery. Your problem (once again) is that you have a limited amount of time in which to accomplish your mission. The instructions tell you that "if you sieze the city on schedule and hold it against counter attack, your victory could provide the breakthrough of the war. If you fail, the entire front may collapse."

"Really for the enthusiast"

The program takes 3.30 minutes to load from tape and you are offered the usual four levels of difficulty. The scrolling screen is quite small, taking up about 50 per cent of the available space. There are various phases; after the Command Phase which starts the game comes the Movement Phase followed by Combat. There is then an Assault Order Phase followed by the actual Assault Phase.

It is obvious that this program has been written with some care but it is really for the enthusiast rather than the general computer user. I always measure the appeal of any programs I am asked to look at by letting my 12 year-old son loose on them. Christopher has played all four of these and found *Operation Whirlwind* the most boring of all. Using the CCI star system for all the programs, you will see that Christopher's mark, in the summary below, was quite low on this one. The game is good but not one that will last as an example of the very best in wargaming.

The final game will last and must rate as an example of the very best in British software. Published by Coventry-based PSS, *Theatre Europe* was written by experienced wargamer Alan Steel, who has taken facts and figures from a number of official sources to create a realistic battlefield on which NATO and the Warsaw Pact countries struggle for European supremacy. The program is priced at £9.95 on cassette and takes a very creditable 2.40 minutes to load. The opening music is, frankly, amazing; the arrangement of "Give Peace a Chance" by Lennon & McCartney is so good that I listened to it many times over — whomever negotiated the deal between PSS and Northern Songs is to be congratulated.

Title	OP.SWORDFISH	THE BULGE	OP. WHIRLWIND	THEATRE EUROPE
Graphics	★★★	★★★★	★★	★★★★★
Sound	★★★★	★★★	★	★★★★★
Playability	★★★	★★★	★	★★★★
Christopher's Mark	★★★★	★★★	★	★★★
Price	£9.95 cassette, £11.95 disk	£9.99 cassette	£11.95 cassette, £14.95 disk	£9.95 cassette
Company	British Software, 85 Greenway, Chislehurst, Kent. Tel: 01-467 0365	Argus Press Software, Liberty House, 222 Regent Street, London W1R 7DB. Tel: 01-439 0666	Ariolasoft, Asphalte House, Palace Street, London SW1. Tel: 01-834 8507	PSS, 452 Stoney Stanton Road, Coventry CV6 5D6. Tel: 0203 667556

I think you may have already realised that I have left the best until last; perhaps it could be said that this is the worst, for it deals with the unthinkable subject of global nuclear war. My first reaction to a 'game' dealing with this subject was not a good one. I, like many others, was disturbed that software should be sold to make money out of something that, in reality would be so uncivilised and inhuman as to warrant little less than total scorn. *Theatre Europe* is a powerful lesson as well as a wargame. I played (if that can be the word) this game more than any of the others for it was a salutory lesson to see how close we are to such a catastrophy. As an historian with an interest in military affairs I am perhaps rare in appreciating how easy it would be for NATO to go 'nuclear' in the next conflict, before the Warsaw Pact. *Theatre Europe* is kinder to both parties in this regard than I would think is actually the real case, for it takes quite a lot of provocation for NATO to use the nuclear option in the game. I wonder whether the programmer adjusted his figure to allow a little more time?

"Peace is preferable"

I am not going to attempt to explain how the game is played for it is very similar in operation to all other wargames. What is different is the sheer quality of research and the skill of writing that make *Theatre Europe* one of the very best of its type. Incredibly enough it also caters for the non-wargamer by having an arcade-action section which can be used or not according to your taste. The wargamer would not need this, but others may find it interesting.

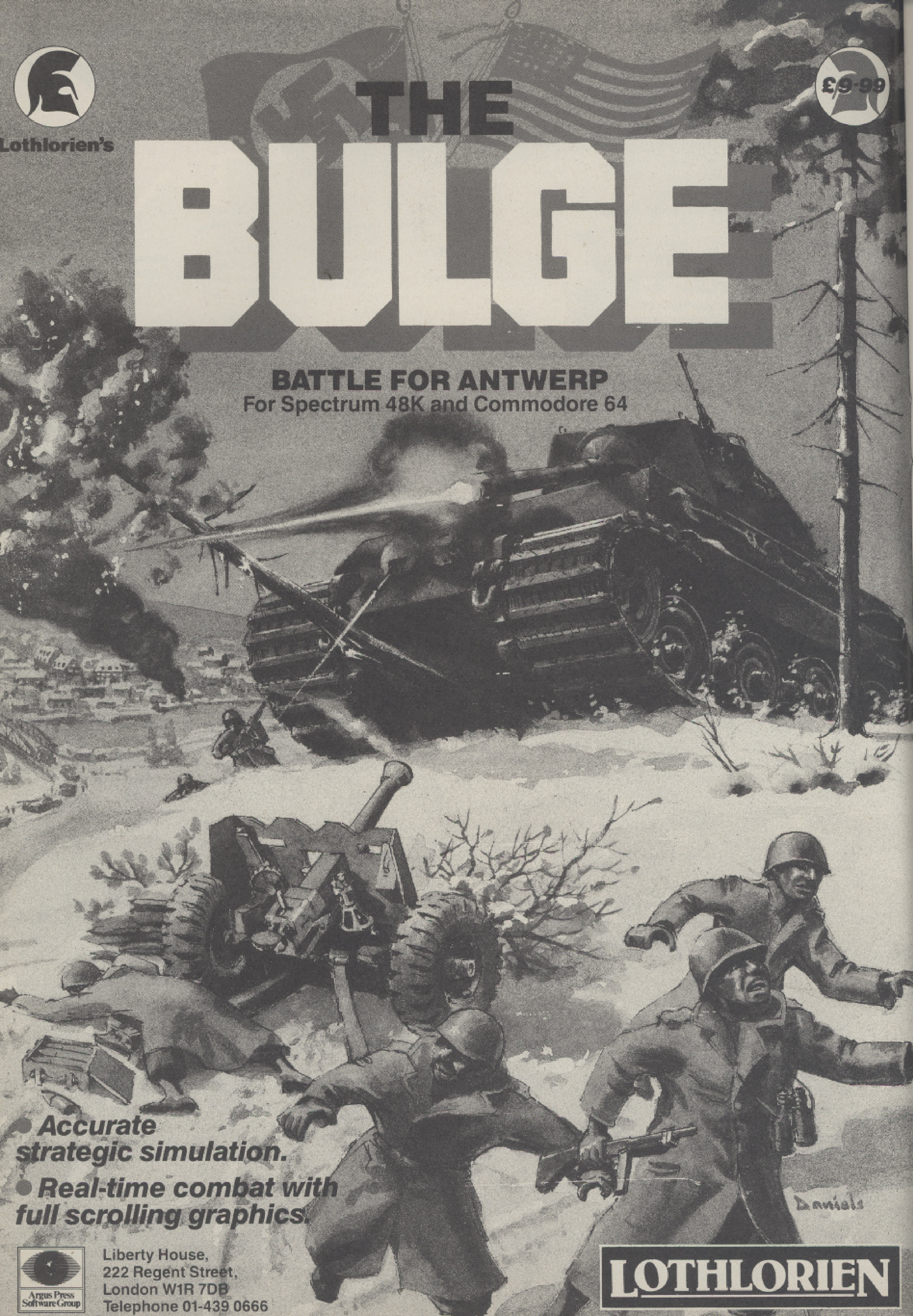
The emphasis with this game is not that fun can be had by trying to blow up the world, but that peace is preferable. The music starts with this theme but when you start to have fun and say to yourself "what the hell, let's send over a couple of nuclear missiles," things become rather too real to be funny any more. An urgent teletype machine blurts out a message telling you to ring a telephone number for an 'authorisation code' to launch the missiles.

Upon actually ringing the long distance number (unless you live in Coventry!) you hear a very realistic radio broadcast of the music from the program which is interrupted by a newsflash informing you that diplomatic relations have broken down between Europe and the Warsaw Pact. Suddenly the broadcast is stopped by the obvious sound of a nuclear explosion — everything goes quiet until the plaintive cry of a baby is heard. A woman's voice then says "if this is what you want the authorisation code is . . .". This salutory message may not put you off using the code and sending your missiles but it at least leaves a bad taste in the mouth when you do. I dread to think what happens to people who ring the number by mistake!

If you decide, as I had to for the sake of this review, that you will go ahead and actually fire off the missiles the realism of the program continues. The scrolling map shows the missiles being launched and on their way to the targets and the retaliatory strike from the other side. A graphics picture then unfolds to show you a landscape of a city being hit and the resulting mushroom cloud, accompanied by very realistic siren and explosion noises. The final thing is a garbled teletype message from control telling you that all targets have been hit but a counter attack is now expected within seconds — finishing with the single phrase "good bye".

Powerful stuff, head and shoulders above all the other wargaming programs I have ever seen, this program will set the standards for the future.

Michael Fopp is a freelance writer and aviation historian and until recently was Keeper at the Battle of Britain Museum, Hendon. Michael is a keep computer user, a pilot and has assisted in developing a number of flight simulator programs. He is a Museum Director and is based in London.



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LOTHLORIEN

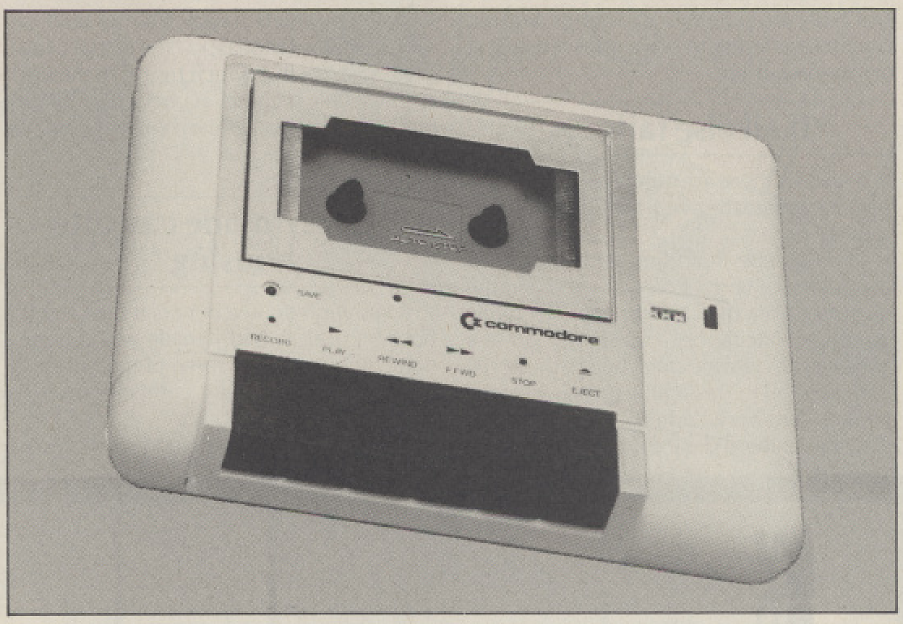
Turbo charged troubles

As the number of games incorporating a turbo loader increases, so does the occurence of loading problems. Electronics engineer Rick Astley explains that this is no coincidence and suggests possible remedies

The correspondent (Dear Editor, CCI March Issue) who is having trouble loading so called Turbo Programs on a well used Datassette is, unfortunately, not alone.

I am among many who have had this problem and, whilst I have managed to improve things somewhat, my efforts have not been wholly successful. Nor have those of Commodore themselves to whom, in frustration, I returned the unit for repair — and paid, incidently, the standard repair charge!

Under normal circumstances, the zeros and ones from which the program is formed, is loaded as 1200Hz and 2400Hz pulses at the rate of 300 per second (300 baud) which, in audio terms, is not particularly demanding of a low cost cassette unit. Furthermore, in order to check that the program is loaded error free, the standard Commodore system loads the program twice which obviously slows the loading procedure considerably.



"Working at higher baud rates"

Turbo Loaders generally use a preloader which has its own loading system and which totally circumvents that intended by Commodore and contained in the Basic ROM. The new loading systems usually have no check system but, more importantly, they work at much higher baud rates.

These higher baud rates are akin, in Hi-Fi terms, to high frequencies and most owners of audio cassette players know that the first result of long use in play/record head wear which results in poor reproduction of the high notes. This is just what happens in the Datassette and a new head will usually solve all problems. Although suitable replacements are readily available, this is not a job for the amateur as miniature tools are necessary for installation and special instruments are needed to align the head and demagnetise it afterwards. However, anyone prefering not to part with £11 and to wait several weeks for Commodore to do the job should find the local radio shop happy to oblige.

In the event that a head change isn't altogether effective then (as a conversation with Commodore's Service Department revealed) a look at the base of the Datassette will probably reveal its origin as Taiwan. It is units manufactured there that apparently suffer from this problem, which I believe results from a poor performance in terms of flutter.

Once again, returning to audio equipment, buffs will know that wow and flutter are parameters on which the quality of cassette players is judged. Wow describes the slow changes of speed which may offend the ear but which are not, unless particularly severe, of consequence when loading cassettes. Flutter, however, is quite a different matter. Flutter is caused by rapid but small speed variations and is caused by lumps or flats on drive wheels or judder in the system.

"Flutter confuses the computer"

When loading standard cassettes, flutter is usually not noticed as the pulses are relatively long and rapid changes of speed get averaged out over the duration of the pulse. The effect of flutter when Turbo loading is very different. If one watches the very short, high frequency, pulses of a Turbo load on an oscilloscope, one can see them stretching and contracting as the speed varies. This confuses the computer as to which are supposed to be long pulses, and which short.

On the Datassette the main cause of flutter seems to be variations in tension on the take-up spool. On one unit I have seen, the drive belt to the Tape Counter was touching the metalwork of the unit once per revolution of the take-up spool, from which it takes its drive. This caused the belt to vibrate like a violin string. Incredibly, this slight vibration was sufficient when passed onto the take-up tension to cause failure to load.

Anyone believing they have this problem may check without dismantling the unit. The belt may be seen working by opening the Eject flap, pressing Play, and looking at the belt as it runs towards the tape counter. Remedial action is not so easy. The fault does not occur when the unit is taken out of its case as the metal work then bends back to its natural position. Try slackening the two screws on the tape counter side of the unit which are part of the four which hold the casing together. Alternatively — if you can stand the inconvenience — remove the offending belt altogether.

Other causes of flutter are uneven slippage of the clutch which allows the take-up spool to change its speed according to the amount of tape on it, and wear on the intermediate rubber drive wheel from the flywheel to the take-up. Both of these faults require attention from Commodore and both are probably caused by leaving the cassette trying to drive after rewinding or fast-forwarding.

"If all else fails . . ."

If all fails there are other things that may be done before throwing the unit across the room.

The Cassette Read line is directly connected to the Serial Port Data line and the dc pulses from the cassette seem to charge up the capacitance, that exists on the cables of any devices attached to the Serial Port, beyond the switching threshold of the input. The very simple remedy is to disconnect these devices, after having first switched everything off.

Yet another fault could be the culprit if the Datassette in question has ever ruined a tape. The 4mm wide magnetic tape is centred in the 12mm deep cassette housing. This means that the little guides at top and bottom of the play/record head should be at just the right height to take the tape towards the head when the Play button is depressed. If the top surface of the bottom guide is not precisely 4mm from the base on which the open edge of the cassette rests then the tape will foul one or other guide. The result of this is that the tape will will not properly contact the head and so not load. Moreover, permanent damage, which may or may not be obvious, can occur to the tape. More often than not the cassette will be found to be sitting too low in it's compartment and in this case the surface on which it rests may be built up with PVC insulation tape. The actual cause is the same as that which results in the tape counter belt rubbing, namely poor alignment of the Datassette housing and its chassis.

"Badly-made cassette housing"

A similar outcome occurs if the cassette housing itself is badly made and unfortunately the quality of some of the housings used by some software companies leaves much to be desired.

Most users faced with loading problems will probably be haranguing Commodore with whom one might sympathise. They are in the situation of having to repair cassette units which actually fulfil the purpose for which they were designed, that is Loading and Saving in the manner Commodore intended. On the other hand, sales of computers are not unrelated to the amount of software available. As most of the latest cassette-based software is Turbo loaded then Commodore computer hardware must be expected to load it, which of course it does — for a time at least!

What about the software houses, do they have any responsibilities in all of this? Well, some Turbos are easier to load than others and so if they wish to use this loading method they do have a choice of system available. I also suspect that in their valiant attempts to beat the software pirates, some companies are producing marginally adequate reproduction quality so that any tape-to-tape copies will inevitably introduce just enough deterioration in order to result in a loading failure.

For my part, I have loaded most of my software onto disk, which, in the case of Commodore equipment, may not be that much faster than Turbo loading, but is far more reliable and convenient. Unfortunately for me, and others wanting genuine back-up copies, the anti-piracy measures make this increasingly difficult. Having paid money to have Commodore check out my Datassette, any software I cannot load from tape will keep going back to the shop from where it came.

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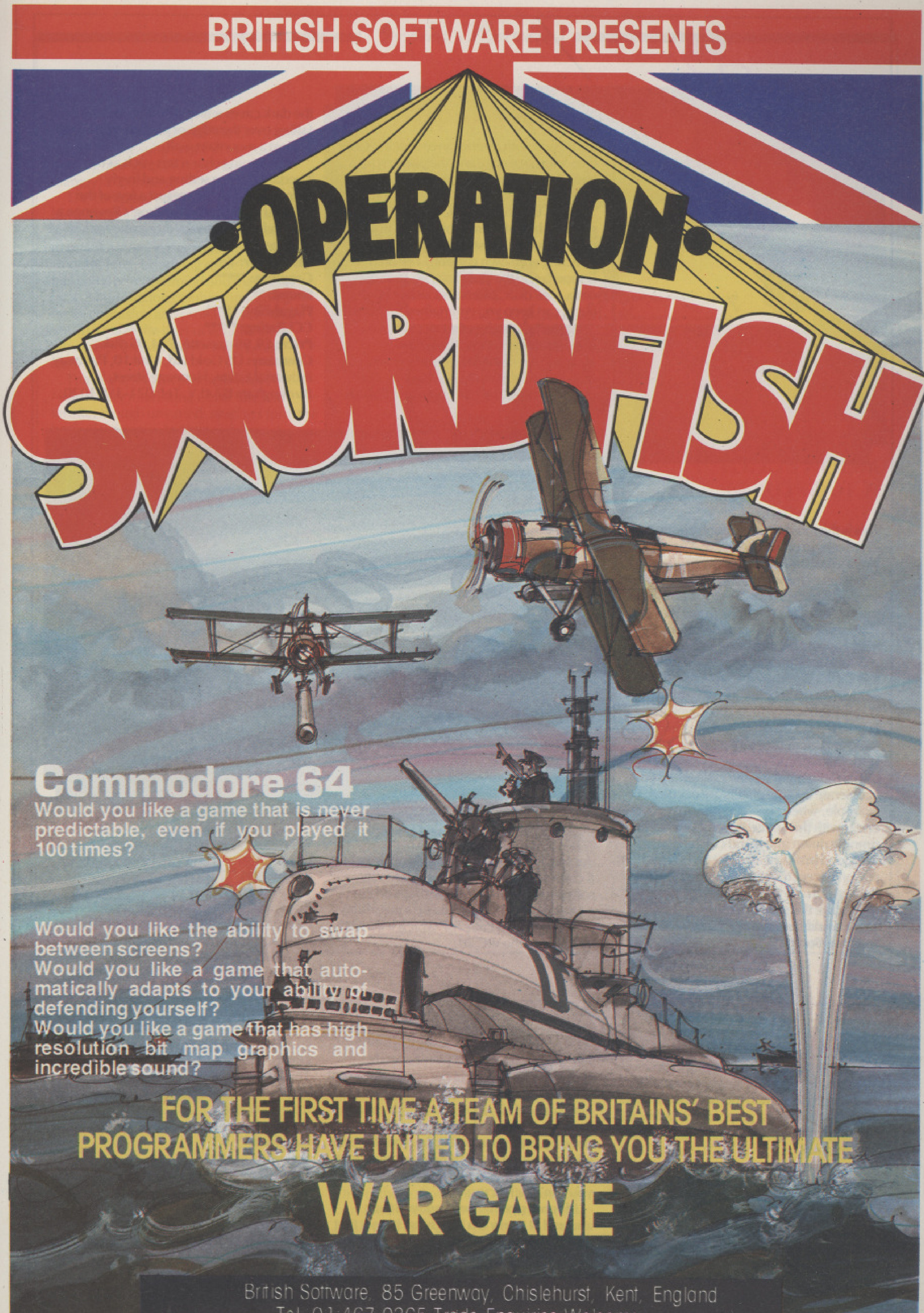

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GROG'S REVENGE

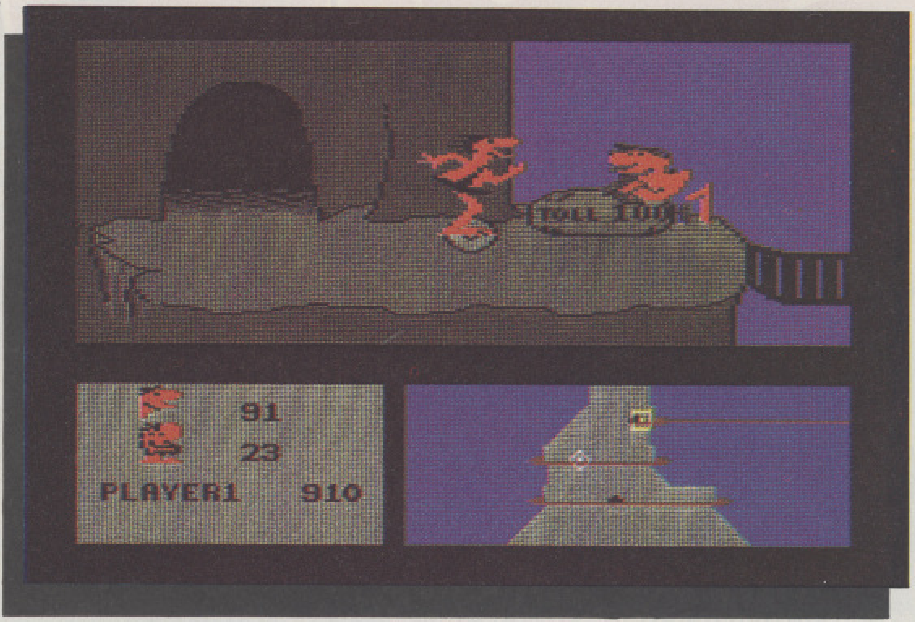
BC is back with a vengeance, but it is Grog who wants revenge and the player rolls happily along on his Stone Age wheel as BC.

This is the sequel to BC's Quest For Tires, released by Software Projects. As in the original, you almost feel as if you're directing your own cartoon. The animation is superb and the situations BC stumbles onto, trips over, plummets into or edges out of can keep you entertained for hours!

Actually, it's a lot of work collecting enough clams to cross the toll bridge or avoiding the jaws of the crawly green monster. All the while you have to steer nimbly around the cliff edges and through the dark caves without killing yourself by falling over the edge or plastering yourself against a mountain wall.

Entertaining characters such as the Tiredactyl, a fun setting and lively animation — those are just a few of the brilliant traits that make Grog's Revenge **a jolly, addictive, sunny day game for kids at any age.**

Fast loader: Yes
Graphics: *****
Sound: ***
Playability: *****
CCI Rating: *****
Price: £9.95 cassette, £14.95 disk
Company: US Gold Ltd, Unit 10, Parkway Industrial Estate, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020.



MOON BUGGY (C16 & PLUS/4)

This is the most curious moon buggy I've ever seen, in pictures at least. It looks more like a small bird on wheels.

But never mind that. Except for a dulling snail-like pace, Moon Buggy is a basic but fun zap-em game best played by the younger set with less experience and who might appreciate the slower pace.

Sound and graphic effects are simple but will suffice if you aren't expecting the world. My main objection was the moon buggy itself with which you travel the jagged terrain shooting and blasting enemy tanks and air missiles. Not only is the vehicle small and very un-spacey looking, but its movement is slow even when you accelerate and the effects are peculiar. For example, when I failed to jump over a crater with this space age craft, rather than running down into it and crashing, it exploded in the air above it for no apparent reason except that there was nothing underneath.

Despite the small memory of the C16, there could (and should) have been more to Moon Buggy. I'm not even certain desperation would be a good reason to buy it considering the other, higher quality software now available. Perhaps one of Anirog's other titles would be a possibility, including Flight Path 737 which won such acclaim on the VIC 20.

Graphics: **
Sound: **
Playability: ***
CCI Rating: **
Price: £6.95 cassette
Company: Anirog Software, Unit 10, Victoria Industrial Park, Victoria Road, Dartford, Kent DA1 5AJ. Tel: 0322-92513/8.

CARRY ON LAUGHING

This game has some explaining to do. What has it to do with laughing, for a start, and why has so much memory been wasted with useless graphics that add nothing to the content, challenge or looks of the game?

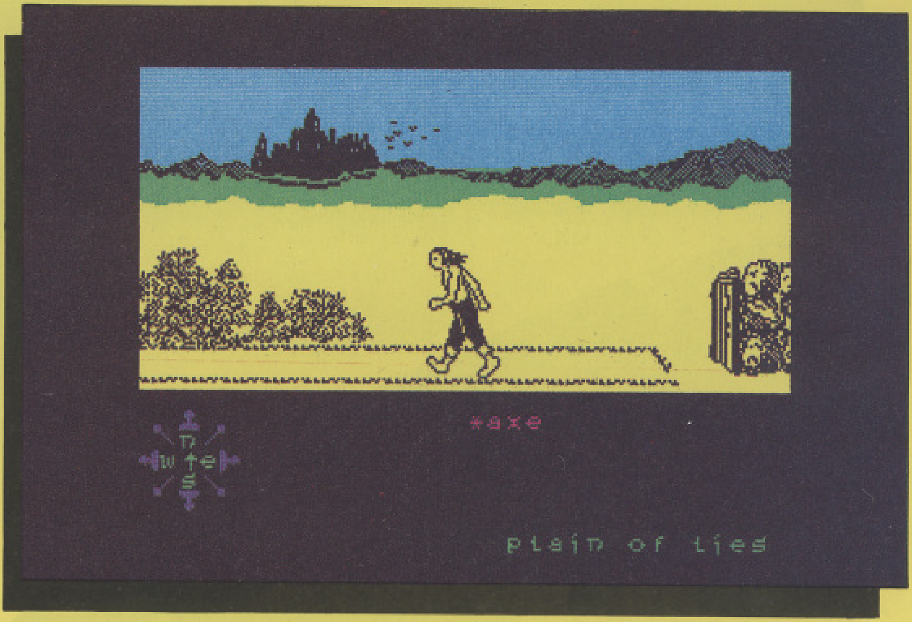
You're a leprechaun-like school caretaker trying to survive another day among mischevious pupils. Your sole reason for being, when it gets down to it, is to change crosses into ticks, four to each screen moving through the school's dining hall, chemistry lab, biology room and computer room. I won't ask why there's a ship parked in the computer room!

The teacher moves left and right and can jump up slightly, though not high enough to move over the whole screen. That is done by getting sucked up by a bubble and gliding around until it gets to a convenient position and then ejecting down to where you can reach across.

I found myself more annoyed than amused at Carry On Laughing. It's not that funny and even some of the unique elements — bubbles and ships in chemistry classrooms — aren't really a saving grace. The limited movement and over-the-top graphics just frustrate efforts without being truly addictive.

Fast loader: Yes
Graphics: *
Sound: *
Playability: **
CCI Rating: **
Price: £6.95 cassette
Company: Livewire Software, Progress House, 31-33 Mount Street, Salford M3 6LQ. Tel: 061-834 4233.

TIR NA NOG



The myth and legend of the Celtic Other World are the subject of this interesting and baffling new graphic adventure from Gargoyle Games.

The company calls it a computer movie but it's actually an enhanced arcade adventure. The 56-pixel-tall leading man is a somewhat Stone Age looking chap with a smooth, long, bouncing stride. His basically-primitive mind and the player's lack of information combine into some awful confusion and probably will land you in a maze the likes of which you've never seen and will never want to see again!

That is the biggest problem with Tir Na Nog. A very interesting Celtic tale and terrific, though unvaried, graphics form the basis of the game, but instructions are despairingly vague and left me baffled about what my immediate aims should be. You control the hero Cuchulainn by keyboard, moving the "camera" through which you see him and then adjusting his direction accordingly.

You also encounter other characters, some of which "can be persuaded by one means or another, to help you." Meanwhile you struggle to avoid or fight them and wonder just what it is you're supposed to do. **It is such vagueness that makes Tir Na Nog frustrating, but an alert, patient mind fascinated by puzzles would have a marvellous time with it.** If you are that sort be sure to give this one a try. For me, there was just too little to latch onto.

Fast loader: Yes
Graphics: ****
Sound: None
Playability: ***
CCI Rating: ***
Price: £9.95 cassette

Company: Gargoyle Games, 74 King Street, Dudley, West Midlands DY2 8QB. Tel: 0384-238777

ROBIN TO THE RESCUE (C16 & PLUS/4)

It's your basic Robin Hood story — the hero braves the dangers of Nottingham Castle to rescue maid Marion from evil, this time in the form of a sheriff (talk about fighting the establishment!).

The format of the game is basic, too, though very well and colourfully drawn. Similarly to the Hunchback games on the C64, Robin treads the fine line of a castle wall, climbs ropes and tries to stay well out of reach of the guards. The game has only a few screens but it will take so much doing to get beyond just one you probably won't need it. Besides, by then you'll be exhausted by the compulsion that kept you playing until all hours.

Sound effects are adequate but reminded me a bit of those familiar Pac Man sounds. Though the concept is not the most original, few on the C16 yet are, and **Robin To The Rescue meanwhile presents a good challenge.**

Graphics: ***
Sound: **
Playability: ***
CCI Rating: ***
Price: £6.95 cassette
Company: Solar Software Ltd, 77 West Drive, Bury, Lancs BL9 5DW. Tel: 061-761 1770.

CIPHOID 9

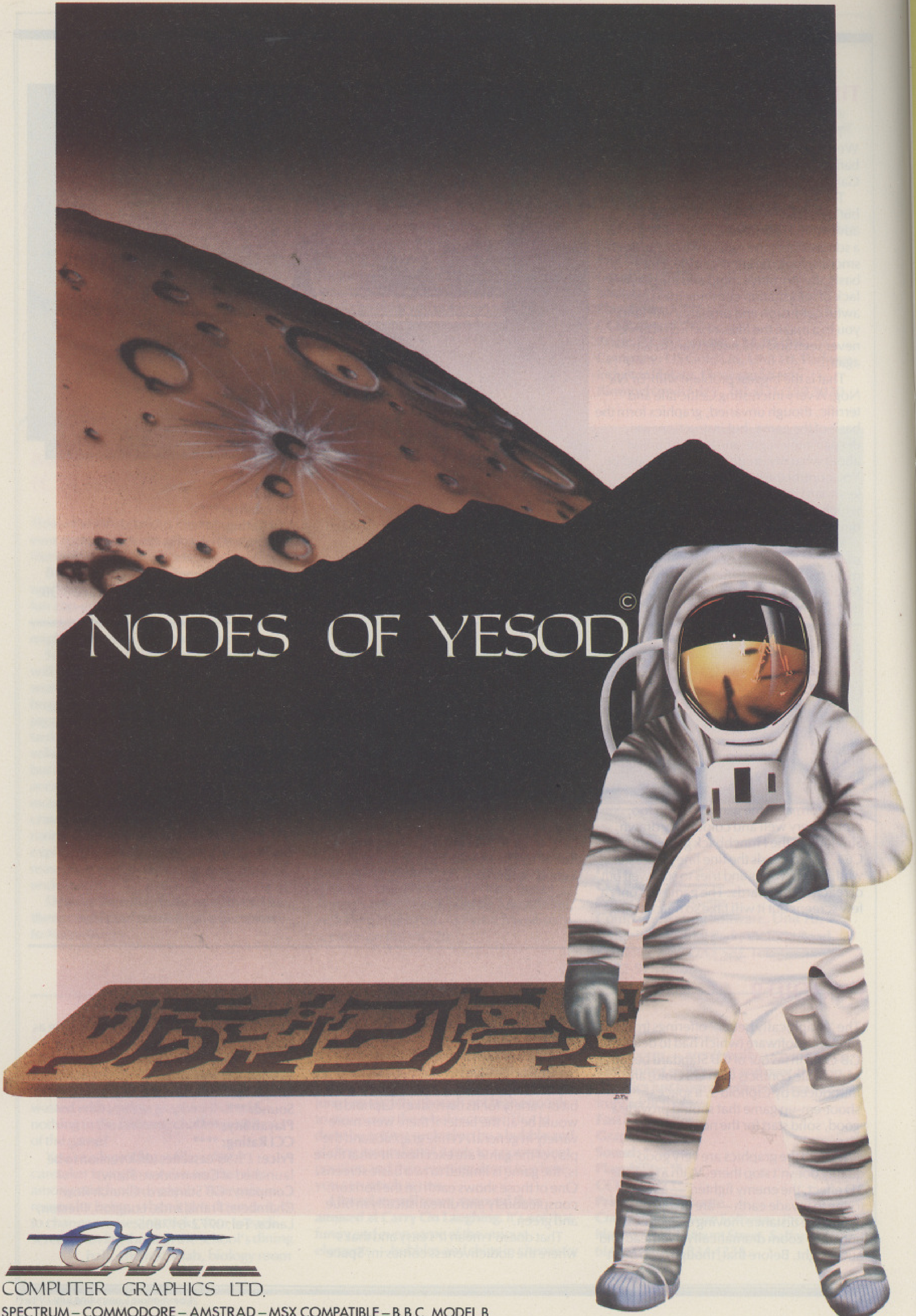
The "graphically better" offerings from Monarch Software (which had to delete its GB Gold in favour of GB Standard because of possible conflicts with US Gold) are introduced by Ciphoid 9, a space shoot-em-up game that should provide a good, solid start for the new company.

Though the graphics are very good, quality doesn't stop there. With a realistic 3D effect, the enemy fighters — aliens trying to invade earth — are just birdlike dots in the distance moving ever closer until they zoom dramatically overhead and out of sight. Before that, though, you must get the ships in your sights and blast them out of the galaxy.

You work from a lunar base that periodically moves to another location under computer control (meaning it's just a bit of variety for its own sake). Ciphoid 9 would be all the better if there were more variety in general. While graphics and the play of the game are excellent in what there is, the game is limited to two basic screens. One of those shows earth on the horizon, conspicuously and unrealistically in blue and green.

That doesn't mean it's easy and that's where the addictiveness comes in. **Space game shootists will love this one** as long as they don't expect a complex background story or a hundred screens.

Fast loader: Monoload
Graphics: ****
Sound: ***
Playability: ****
CCI Rating: ****
Price: £9.95 cassette, (disk version to be launched at Commodore Show)
Company: GB Standard, Church Row Chambers, Franklands, Longton, Preston, Lancs. Tel: 0772-617665.



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IMPOSSIBLE MISSION

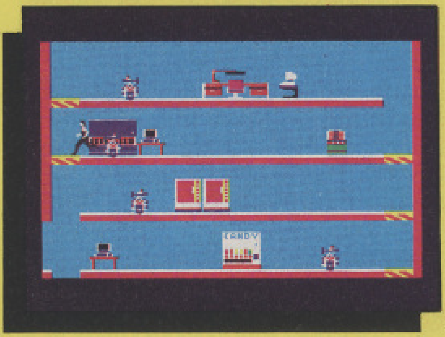
Editor's note: As promised, CCI will be running games reviews from readers other than our panel. This one was sent in by 13-year-old Nirupam Goenka in Woolton, Liverpool

Epyx established its name on the computer market by its excellent Summer Games and has now strengthened that reputation by its best offering yet.

Your mission is to save the world from nuclear annihilation by Dr Elvin, a super hacker who has broken into the defence systems and is going to cause a nuclear holocaust. You are the hero trying to stop him.

Aha, another Manic Miner platform game you say. Well, it is a platform game, but there the similarities end. This is the ultimate platform game. As soon as you hear the excellent opening speech in a perfect English accent with a creepy touch to it, you will realise this a very special game.

In graphics, the man runs perfectly normally. Usually, you only have two images of running, eg right leg up, left leg down and vice versa displayed one after another. But here it uses many more images and this guy really runs. He is also an athletic person when he somersaults — superb animation. The robot's don't seem to like you either and contact with them or the beams they fire disintigrates you. By pushing the joystick up, you search various objects for puzzle pieces to break Elvin's secret code.



If you fall down a shaft, the man screams convincingly. Sometimes when you enter a room you hear a spooky voice snarl "Destroy him my robots!" If you fail, as you probably will — its title isn't Impossible Mission for nothing — it gives a convincing laugh.

People who have Ghostbusters will know what I am talking about. **Brilliant game — a must for any software collection.**

Fast loader: Yes
Graphics: *****
Sound: *****
Playability: *****
CCI Reader's Rating: *****
Price: £8.95 cassette, £11.95 disk
Company: CBS Software International, Ashbrook House, 3-5 Rathbone Place, London W1P 1DA. Tel: 01-734 8181.

PARKY AND THE YELLOW SUBMARINE

With a penguin that looks more like a potato and a subterranean cavern of brick, Parky and the Yellow Submarine look terribly promising at first sight.

Despite the obstacles, though, this game is surprisingly addictive. Your potato-penguin, Parky, flaps his (its?) arms and legs in time to the movement as you guide it through caverns searching for pieces of the submarine and your twin brother Perry or, failing that, to at least keep up your energy with fish and chips. The thought of all that cholesterol may make you ill but the anxious ulcers you get from this addictive game will divert your attention.

Parky tends to be quite sensitive so any collision with the (brick) walls or sea creatures in his path is fatal and you only have five lives to work with and the bonus points you start with are dwindling all the time.

There are 91 caves to find your way around in this maze game. Scrolling is smooth and plenty of upcoming evils keep your mind occupied. A few little beeps of sound at appropriate times might have been nice to keep you from being hypnotised by the repetitive background music, but **generally, it's a challenging way to while away a few mindless hours.** But don't expect a deep plot.

Fast loader: Novaload
Graphics: **
Sound: *
Playability: ***
CCI Rating: ***
Price: £6.95 cassette
Company: Cheetah Marketing, 24 Ray Street, London EC1.

BOUNTY BOB STRIKES BACK

This ingenious title, the sequel to Miner 2049er, gives whole new meaning to platform games.

Very difficult as it is to even get started, you'll probably find yourself struggling on and on in spite of yourself. A demonstration mode gives a good idea of what is going on and detailed instructions explain every facet of the game.

But that is not all it takes. Bounty Bob Strikes Back requires a very sensitive, coordinated touch on the joystick as you try to cover every inch of gold mine territory on the screen to lay your claim on it. Mutant organisms and dangerously high cliffs daunt you at every chance, unless of course you've turned them temporarily into harmless creatures that can be eaten by you instead.

Canons, transporters, suction tubes and hydraulic lifts are a small sampling of the items you have to work with — if you get there and if you survive even the first harrowing moments. **The game shows quality and attention to detail at every part** not only to make it nice to look and listen to but to make it fun and worth your while to play.

Bounty Bob also has some marvellous extras. The unique score board set-up makes the usually dull function of typing in your name and registering the score an adventure. It sounds wasteful, but one look will change your mind.

Fast loader: Novaload
Graphics: ****
Sound: ***
Playability: ****
CCI Rating: ****
Price: £9.95 cassette, £14.95 disk
Company: US Gold Ltd, Unit 10, Parkway Industrial Estate, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020.

All games reviews appearing in this magazine are personal opinions and serve only as a guide to new games on the market. Our star ratings for graphics, sound, playability and the CCI rating are as follows:

*** = Poor**
**** = Average**
***** = Good**
****** = Very good**
******* = Excellent**

ENTOMBED

You'll be climbing the walls of this tomb in addictive frustration before you're through.

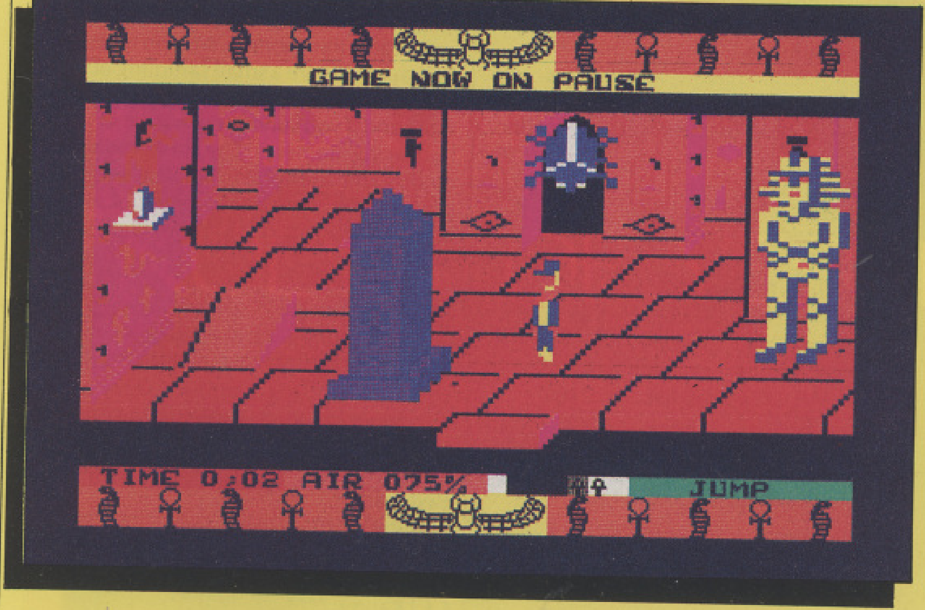
Ultimate Play The Game has topped its popular Staff of Karnath graphic adventure with the high quality sound, graphics and play that made Karnath so popular. As before Sir Arthur Pendragon is a bit less than regal. (Why can't animated characters look as commanding as their names and positions suggest?) Nevertheless, the graphics hold a maze of surprises for those with enough stamina to see the adventure through.

Your puppet, Arthur, has found his key, but is trapped in a sarcophagus where his only chance to escape is finding scrolls to give him clues. A whip helps ward off the surprisingly large number of creatures still alive in this airless hole, and a torch guides you along the darkest paths. But you can't use both and you can't jump with either; the fire button on the joystick controls whichever you designate on the keyboard, only one at a time.

Entombed is complex with a lot of possibilities, though the list of 62 "features" is an insulting exaggeration. For one thing, the list is on the instructions so anyone reading would already have bought the game and doesn't need to be told.

Sound effects like scraping stone doors and tapping footsteps are an excellent contribution and drive you on just as the game itself does with its spooky maze to keep you wondering . . . and wandering.

Fast loader: Yes
Graphics: *****
Sound: *****
Playability: ****
CCI Rating: ****
Price: £9.95 cassette
Company: Ultimate, The Green, Ashby de la Zouch, Leicestershire LE6 5JU. Tel: 0530-411485



TALLADEGA

This is one-race car simulation that requires a bit more foresight and thinking than the average.

The premise is that Alabama town in American's Deep South that annually hosts the Talladega 500 stock car race. Imported from Cosmi software house in the US, Talladega the game retains those native touches like the "Dixieland" theme song and racing king Richard Petty as the man to beat.

But the familiarity of computer racing overcomes any initial strangeness, and some original features take Talladega to the top of the pile. You race not only against Petty but against 18 other drivers, all of whom are programmed to make individual moves. In the pit, rather than controlling the specific actions of the workers, you merely choose something to be done and watch the crew take the necessary steps. Instructions are much better than any I've seen for such a game, complete with tips for speed and skill.

Choice of tracks is limited to two — the standard oval and the more difficult Random which lets the computer choose a track with varied short and long runs. Sound could have been better, and a background buzz when not in play is annoying. Finally, monitoring conditions is not as simple as should be because they are in a box at the top of the screen rather than a more readable instrument panel at the bottom. But few simulations have that.

Despite these objections, **Talladega gives that racing thrill effect making it a breath-taking game to play.**

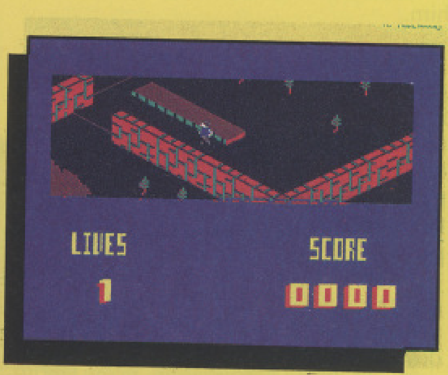
Fast loader: Novaload
Graphics: ****
Sound: ***
Playabiltiy: ****
CCI Rating: ****
Price: £8.95 cassette
Company: Audiogenic Ltd, 39 Suttons Industrial Park, London Road, Reading RG1 6AZ. Tel: 0734-664646.

BLAGGER GOES TO HOLLYWOOD

Don't expect to succeed easily with this one. If nothing else, you'll be distracted at first just trying to suss out the famous theme tunes.

And that's just on the title screen. The television and film themes come up again throughout the game with their respective characters — Kojak, Superman, The Hulk and Robin Hood among them.

Blagger Goes To Hollywood is set in a film studio with the player, Blagger, hurling props at those much-loved characters to get them out of the way, for Blagger must do his dirty deed — steal Steven Spielbum's latest film.



The studio has 12 sets, fairly bare in graphical terms but saved by good animation in the not very friendly characters ranging from Superman's flapping cape to Batman's mask and Kojak's bald head. You pick up a prop by walking over it and hurl it using the fire button, though direction is very difficult to control until you've had quite a lot of practice. Meanwhile, people and things chase ruthlessly after you when you get onto their own territory.

An angled screen display makes joystick commands awkward, ie moving the joystick left moves Blagger from center to the top left corner of the screen rather than straight left. It's a matter of perception and takes a bit of getting used to. I also found myself walking "inside" a wall a few times.

Though the concept is simple, the game isn't and quickly gets you hooked. And if you get tired, you can always let the characters and the well-generated music entertain.

Fast loader: Yes
Graphics: ****
Sound: ****
Playability: ***
CCI Rating: ****
Price: £9.95 cassette, £11.95 disk
Company: Alligata Software Ltd, 1 Orange Street, Sheffield S1 4DW. Tel: 0742-755696.

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Expiry Date: CCI

SUPER HUEY

This is one of those long-awaited flight simulators that begs for attention at every go and gets it. It's an American game sold in the UK by both US Gold and Audiogenic, so CCI took a look at both.

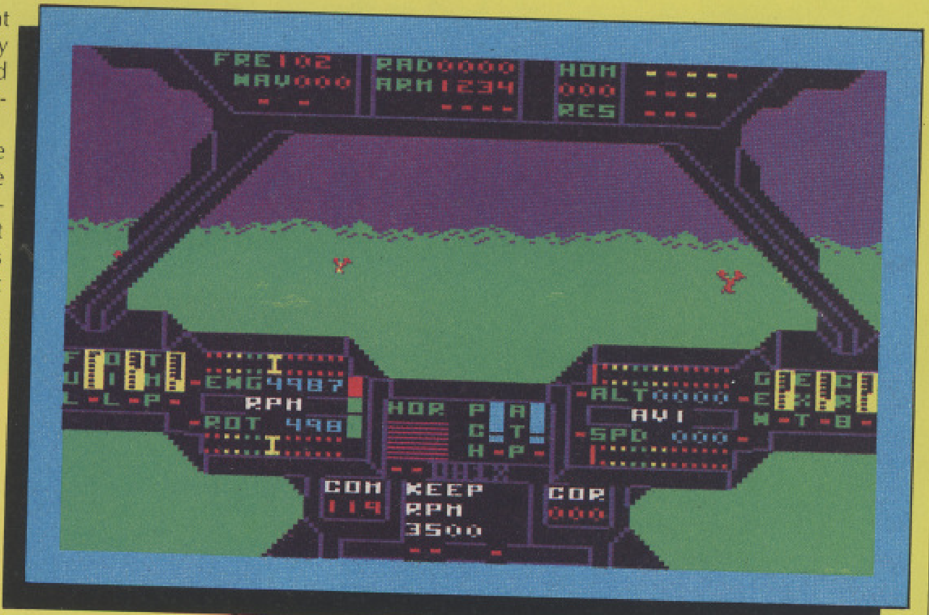
USG's is all on one cassette, but a table of tape counter locations lets you move straight into one of the four subject areas — Solo Flight, Rescue, Explore and Combat — a terrific convenience, (though I was outraged to find three typos in the first paragraph of instructions; such carelessness in a supposedly sophisticated game does not give a good first impression.)

The next thing you see on either version is the UH-1X helicopter cockpit, a highly impressive scene with enough instruments and guiding devices to boggle your mind immediately. Instructions are pages and pages long, but much of the decision-making is left up to you and you fend for yourself in controlling the craft.

The control panel has 28 instruments plus malfunction indicator lights for most. It's a real challenge of coordination and patience to master each function, but the thrill of success after all that hard work is worth it for those who wallow in flight simulators.

The joystick has 12 functions including throttle, lift/thrust, left and right rudder and banking. In addition to very clear and detailed instructions, you get a step-by-step flight instruction card — basically a summary to get the feeling of taking off, flying and landing. Though only one can play at a time, Super Huey is more fun with a co-pilot to shout directions at you (and shriek when you crash).

Sound is sensational with a realistic buzzing hum and whipping of the blades to give you the real sensation of flying, hovering, changing throttle, etc. The landscape changes slightly depending on what part you're playing at the 3D effect draws you into the action.



So Audiogenic has Super Huey, but then so does US Gold. Audiogenic's comes on cassette only for £1 less than the US Gold version but with two tapes. US Gold also has a disk version. But both are by the American software house, Cosmi, both have fast loaders and the instructions are almost word for word though in different form.

Confused? Well the two British companies each have non-exclusive contracts to market Cosmi's games in the UK. Naturally, the company releasing the game later would price it just a bit lower to snatch the business. But, perhaps all this is of no concern to you, the games fanatic. All you want to know is whether it's any good — either of them.

In play each gives the same **dramatic flight-like experience.** Whether you're exploring, fighting, rescuing or just learning, you may well breathe a sigh of relief when you land.

Fast loader: Novaload on both versions
Graphics: ****
Sound: ****
Playability: *****
CCI Rating: *****
Price: £8.95 cassette only from Audiogenic Ltd, 39 Suttons Industrial Park, London Road, Reading RG1 6AZ. Tel: 0734 664646; or £9.95 cassette, £14.95 disk from US Gold Ltd, Unit 10, Parkway Industrial Estate, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020.

TOWER OF EVIL (C16)

He sounds like a tap dancer and looks like Humpty Dumpty, so what is he doing in a tower rescuing a princess?

Basically that is the essence of (or excuse for) Tower Of Evil, an uningenius attempt to make a tame but very fast-paced zap-em game. The premise is that Andros — the egg-headed one — is banished from court until he rescues the king's gold and the princess Diana, now in the hands of — yes, you guessed it — a necromancer.

The game has plenty of nasties, some of whom fight back if you don't fling fireballs from your fingers fast enough. Control is by joystick or keyboard and bits of treasure are picked up by running over them. Between eight levels there are more than 60 rooms, though the differences between them are almost negligible.

Despite the relatively simple form of Tower Of Evil, it is an addictive game as many of these formats are. It would have been nice to see something a bit more distinctive, however, and to have a high score board for that healthy sense of competition.

Graphics ***
Sound: ***
Playability: ****
CCI Rating: ***
Price: £5,95 cassette
Company: Creative Sparks, First Floor, Thomson House, 296 Farnborough Road, Farnborough, Hants GU14 7NU. Tel: 0252-543333.

GATES OF DAWN

Arcade adventures have been a difficult medium to make successful because they try to combine the challenge of the mind with the challenge of coordination and the best of both worlds is difficult to achieve.

A slight success is Gates of Dawn, despite its ambitious attempt to "release you into the world of the dream." It's claim that "dreams are a sleeping fantasy where nothing is too fantastic" sounds like an excuse for anything that happens that shouldn't, but there's nothing quite so bad.

You travel through corridors of the mind in search of some vague secret, but instead of forcing you to make a map, a grid at the top right hand corner of the screen keeps track for you. The items you collect are listed too, and commands are chosen from a list.

Control is by keyboard and joystick, one of those annoying and awkward traits of several games we've seen lately. Actions that are supposed to be "done quickly" cannot be when you constantly switch between one and the other.

Animation is bright, but the vivid colours seem to cover up the otherwise simplistic graphics. The creatures and objects in your way are a highlight but the 3D effect is only okay.

You'll need very quick reactions to deal with Gates of Dawn as it springs up some striking bits, enough to keep up the interest. I'm afraid I cannot call this a total success as arcade adventures go, but then I have yet to see one.

Fast loader: Yes
Graphics: ***
Sound: ****
Playability: ***
CCI Rating: ***
Price: £8.95 (cassette)
Company: Virgin Games, 2-4 Vernon Yard, Portobello Road, London W11 2DX. Tel: 01-727 8070.

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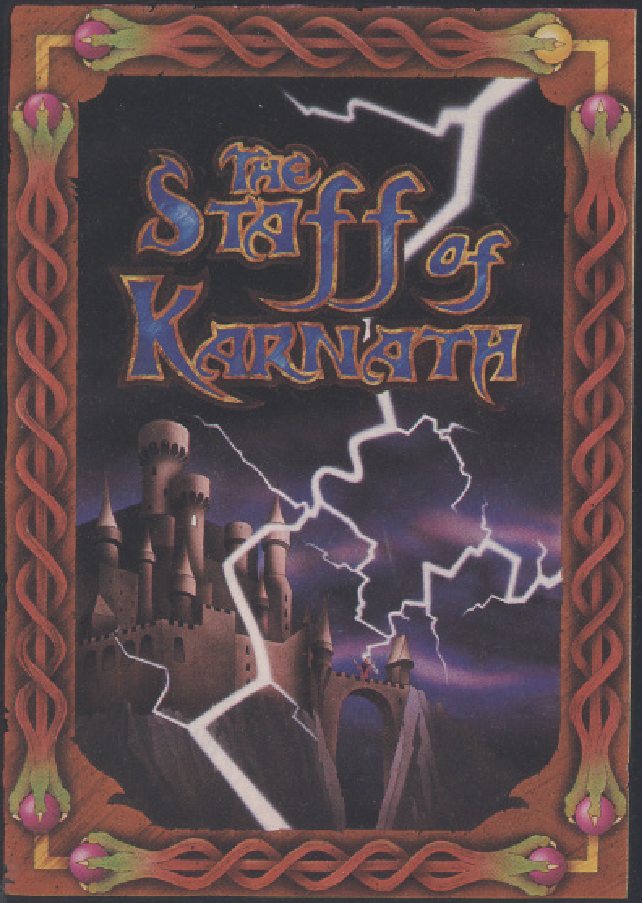
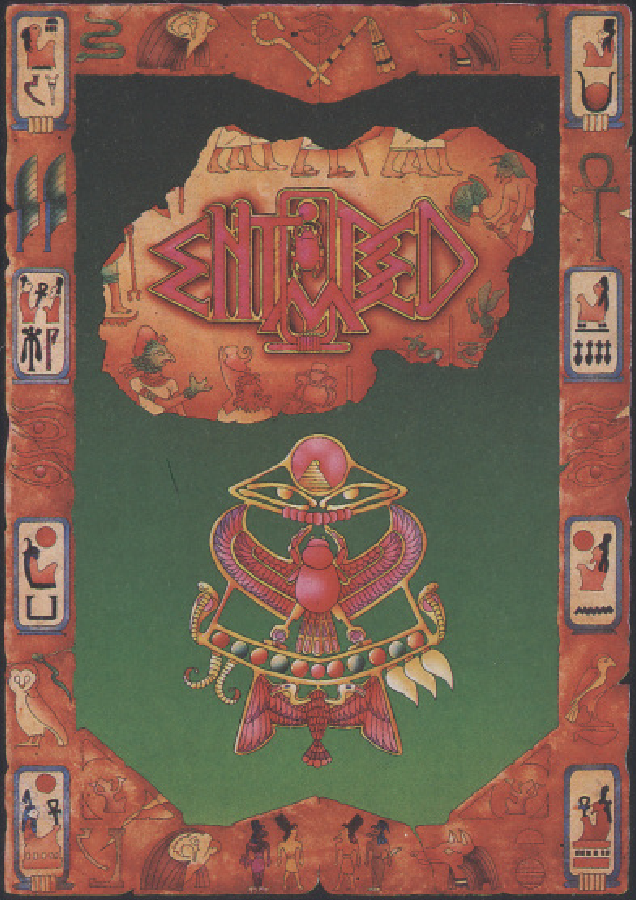




"STAFF OF KARNATH" and "ENTOMBED" recommended
retail price £9.95 inc VAT. Available from W.H.SMITHS, BOOTS, J.MENZIES,
WOOLWORTHS and all good software retail outlets. Also available from
ULTIMATE PLAY THE GAME, The Green, Ashby-de-la-Zouch, Leicestershire LE6 5JU
(P&P are included) Tel: 0530 411485

NEW GAMES RELEASES

ARCADE

Quasimodo and **Bounty Bob Strikes Back** (review this issue), (£9.95 cassette, £14.95 disk), both released for the 64 by US Gold Ltd, Unit 10, Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020; on Quasimodo in collaboration with Ocean.

Roland's Rat Race, (£7.95 cassette), released for 64 by Ocean Software Ltd, 6 Central Street, Manchester M2 5NS. Tel: 061-832 6633.

Peacewomen, (£5.50 cassette), released for 64 by KnightSoft, The Round Table, 87 Brunswick Street, Burnley, Lancashire BB11 3LE. Tel: 0282-414151.

Clumsy Colin Action Biker, (£1.99 cassette), released for the 64 by Mastertronic, Park Lorne, 111 Park Road, London NW8 7JL. Tel: 01-486 3478.

Amazon Warrior, (£7.95 cassette), released for the 64 by New Generation Software, The Brooklyns, 15 Sunnybank, Lyncombe Vale, Bath BA2 4NA. Tel: 0225-316924.

Hi Bouncer! (£6.95 cassette, £9.95 disk), for younger (or the young at heart) 64 users by Mirrorsoft, Holborn Circus, London EC1P 1DQ. Tel: 01-822 3913.

Gribbly's Day Out, (£7.95 cassette), for 64 (review this month) from Hewson Consultants Ltd, 56B Milton Trading Estate, Abingdon, Oxfordshire. Tel: 0235-832939.

Chopper and **Taskmaster,** (£2.50 cassette) for 64 from Sparklers range of Creative Sparks, Thorn EMI Computer Software, Thomson House, 296 Farnborough Road, Farnborough, Hampshire GU14 7NF. Tel: 0252 543333.

Blagger C16, (£6.95 cassette), for C16 from Alligata Software Ltd, 1 Orange Street, Sheffield S1 4DW. Tel: 0742 755796.

ADVENTURE

Strangeloop and **Gates Of Dawn** (review this month), (£8.95 cassette), arcade adventures for the 64 from Virgin Games Ltd, 2-4 Vernon Yard, Portobello Road, London W11 2DX. Tel: 01-727 8070.

Lands Of Havoc, (£6.95 cassette), arcade adventure for the 64 from Microdeal Ltd, 41 Truro Road, St. Austell, Cornwall PL25 5JE. Tel: 0726-3456.

Journey's End, (£2.99 cassette), of Master Adventurer line for 64 from Mastertronic, Park Lorne, 111 Park Road, London NW8 7JL. Tel: 01-486 3478.

Shadowfire, (£9.95 cassette, £11.95 disk), icon-driven adventure for the 64 from Beyond Software, Lector Court, 153 Farringdon Road, London EC1R 3AD. Tel: 01-837 2899.

MISCELLANEOUS

Frank Bruno's Boxing, (£7.95 cassette), boxing simulation for the 64 from Elite Systems Ltd, 55 Bradford Street, Walsall, West Midlands WS1 3QD. Tel: 0922-55852.

Jump Jet, (£9.95 cassette, £11.95 disk for 64 only), flight simulation for 64, C16 and VIC 20 from Anirog Software, Unit 10, Victoria Industrial Park, Victoria Road, Dartford, Kent DA1 5AJ. Tel: 0322-92513/8.

Londoners win synthesisers

CCI is pleased to announce the lucky winners of the Ariolasoft competition run in our May issue.

Mr B Chillas of Hanwell in London and Allan King of Eltham in London are the two first place winners of a Currah Speech 64 voice synthesiser. The challenge was to unscramble 55 letters to form the words in four titles of Ariolasoft games. The correct answers were Lode Runner, Murder On The Zinderneuf, Raid on Bungeling Bay and Archon.

The next four correct entrants each receive a Boss joystick. They are Mr M Walton of Newbery, Berks; Martin Younger of Stockport, Cheshire; Mr G Clark of Locking, Avon; and C Morgan of Llanelli, Dyfed.

Fifty runners up each get one Ariolasoft discount voucher, usually only got by buying a game, for collecting toward discounts on joysticks, voice synthesisers and a disk drive. The winners are Robert John Varnes, Walthamstow, London; Mr G L Dodd, Solihull, West Midlands; N Roddis, Weymouth, Dorset; Ian Mead, London W14; James Murrell, Enfield, Middx; A W Thackray, Dunstable; S C Birks, Stoke-on-Trent; N Blackbrough, Offenham, Nr Evesham; Mrs A A Schofield, Cheltenham, Glos; David Parr, Coventry; Niki Sihillinglaw, London W12.

Mr B G Harrison, South Killingholme; Roy Harrison, S Humbs; Mr A Gaskell, St Helens, Merseyside; Ian Davie, Shepshed, Leics; Mr T A Motley, Braintree, Essex; Richard J Patient, Ipswich, Suffolk; Mr C Taylor-Balls, Lavenham, Suffolk; Mr P Reynolds, Tidworth, Hants; Mr R Baillow, Stapleford, Notts; Mr C Long, Anlaby, Hull; Mr C M Keane, Boston, Lincs; Thomas Hiscox, Woking, Surrey; Cory Kin, London SW18; Stuart Davidson, Shardlow, Derby; J Brooks, Weymouth, Dorset; Lisa Patterson, Burscough, Lancs; Simon O'Connor, Worthing, Sussex; Miss E J Glover, Chatham, Kent; G Gillett, London N19; Kevin Denyer, Chiswick.

Nigel White, Norfolk; Ben Chapman, Sale, Cheshire; S D Christian, Childwall, Liverpool; Mr Ian Stuart McKie, Bridlington, Humberside; Steve Wood, Warley, West Midlands; Daniel Jones, Purley, Surrey; Sidney J G Reeves, Birmingham; Paul Rogers, Boxmoor, Herts; Peter Piggott, Cambridge; Mr J Eagle, London SW6; N G Marshall, Newbury, Berks.

Paul Riley, Chapel-en-le-Frith, Cheshire; Peter Robert Sutton, Hindley, Wigan; Mr B Wallis, Cogenhoe, Northampton; Mr R J Cole, Hereford; Simon Barker, Swavesey, Cambs; David Rhodes, Blackpool, Lancs; Reginald Davis, Wolverhampton; and Pakesh Patel, Leeds.

The Dommodire Kid
by Max
MEOW!
POW!!
CRASH!
FIRE!!
DOGS OF WAR
MEOW! HUNGRY!!! FOOD
RATTATTAT!! POW! BANG!
ZOOM! POW! UNK
SCORE!
EEAOW!
BOOM
ZAP!!!
SCORE!!! SMASH!!
RATATATTAT !!!!!
BANGBANGBANG!!
FIRE!! FIRE!! KILL!!
POW!
BLEEP BLEEP !!
— NEEAW !!
NO FOOD! THIS IS WAR!

Mischievous Herbert back

Little "Everyone's A Wally" star Herbert dons what looks like a crown of fig leaves for the next part of the series entitled Herbert's Dummy Run.

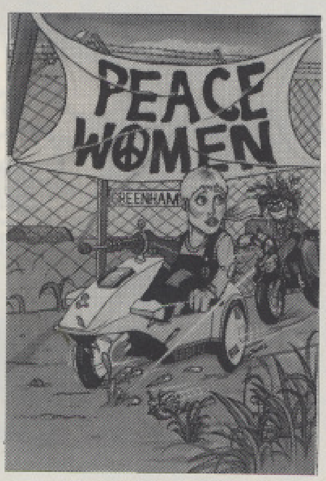
Herbert is now a toddler and has gone shopping with Wally and Wilma to the department store. Being the nuisance that he is, of course, he's wandered off and gotten lost and now must make his way back to lost and found to be reunited with his family.

Along the way, each department of this elaborate shop from the toys to furniture has something "in store."

The game is released by Mikro-Gen and retails for £9.95 on cassette only.

Contact: Mikro-Gen, 44 The Broadway, Bracknell, Berks. Tel: 0344 427317.

Greenham gates are games subject



Now that games programmers are getting bored with the usual storylines and scenes, the parodies begin — and one of the most recent is Peace Women from KnightSoft.

If you haven't already guessed from the title, the subject is the women of Greenham Common. It seems incredible that such an involved issue can be reduced to the level of computer gaming, and it is. The programmers have merely used it for a storyline and it's still your basic goal-oriented spree. The player's aim is to drive your Cee5 Special through the MOD defences to breach the fence at Greenham Common.

KnightSoft claims "possibly some of the best music ever written on the CBM64," and the price is a nominal £5.50. The company makes plain that "this program does not reflect any political affiliation or opinion of KnightSoft or the programmer." Makes you wonder just how cruel it is.

Contact: KnightSoft, The Round Table, 87 Brunswick Street, Burnley, Lancashire.

Get punchy

Summer is coming on and with it the eagerness for sports of every kind. The computer market is no different.

Along with the simulations coming up from Commodore and other companies, Alligata is planning a more arcade-like boxing game. A price hadn't been set at press time, but it is expected to be released sometime early in July.

Called Knockout, the game will offer play for two people or for one playing against the computer.

Meanwhile, Elite Systems looks to beat Alligata to the blow with a boxing simulation of its own. Called Frank Bruno's Boxing, it takes the name of the 23-year-old European heavyweight challenger. Out of 20 amateur fights, Bruno won 19 and was the youngest contestant to win the British amateur championship before he turned professional at age 18.

The game explains boxing as a sport but also includes a simulation to let the player "experience the excitement and psychology behind the game." It is set for release in July for £7.95 on cassette.

Computer game to make skin crawl

It's not the most pleasant subject. In fact, it could give you nightmares. It's RATS!

Hodder and Stoughton Software seems to think the subject will be appealing this time in the form of a computer game based on James Herbert's bestselling book The Rats. The format will be strategy-adventure and brings "an atmosphere of terror" through "some very clever techniques for the presentation of horror on the computer screen."

Great!

The game is being designed by Five Ways Software and will sell for around £7.95 or £9.95 with the book, though you do not need to have read it to play the game. More than that, H&S aren't saying.

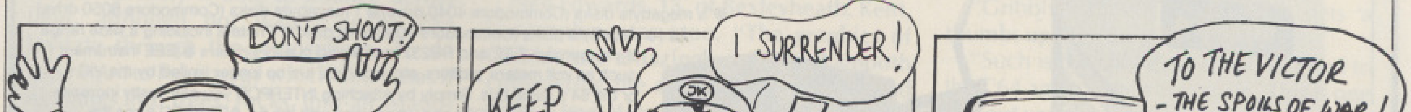
Programming earth's end

One of Virgin Games' most successful items on the Spectrum has been converted to the 64 with more rooms and new ingredients to spice it up.

Strangeloop is an arcade adventure set in a robot factory at the edge of a distant solar system. Robots that traditionally performed the meagre tasks on earth have been reprogrammed by vicious aliens to destroy the planet, so the player takes on the task of recapturing control of the factory. The catch is that no one's been there for hundreds of years so no one has a map of the place. Ergo, adventure.

Strangeloop is available at £8.95 on cassette only. Virgin is also releasing Gates Of Dawn at the same price. (See review this issue).

Contact: Virgin Games Ltd, 2-4 Vernon Yard, Portobello Road, London W11 2DX. Tel: 01-727 8070.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KEEP MOVING!
I SURRENDER!
TO THE VICTOR - THE SPOILS OF WAR!
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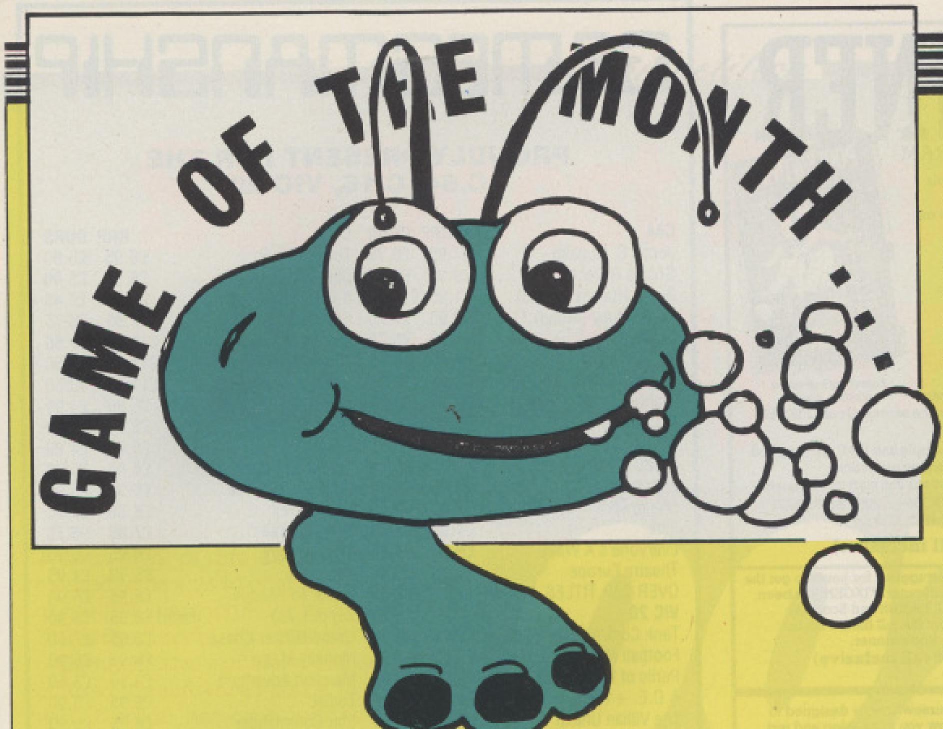


"For all the scientific blurb, the moment I started to play Gribbly's Day Out I thought of frolicking in the country."

It's this light, summertime feel described by 16-year-old Julien Francois of London that was echoed in many of the reviews by our panel this month. Gribbly's Day Out is the newest Commodore game from Hewson Consultants and a slight step aside at that, as 15-year-old Tim Burke of Manchester pointed out.

"It is a marked departure from the flight simulations they are now synonymous with, as it features music, pretty graphics and arcade-style addictiveness."

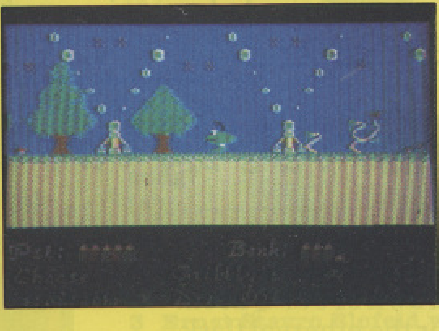
Gribbly retails at a modest £7.95 despite the thought and originality that so obviously went into this production, written by programmer Andrew Braybrook.

"You control the movements of Gribbly, a cute, one-footed alien who has the unenviable task of saving the baby Gribblys, called Gribblets, from the clutches of the other life form on the planet, the Topsies," explains John Archer, 14, of Ashbourne. "These metamorphosise and increase in notoriety as the game progresses. Also there is the dreaded mutant Seon and his web to contend with."

Paul Serbert, 22, of Harrogate, elaborates: "Gribbly is able to bounce across land, although not water, or he can levitate through the atmosphere. To do this requires Psi-energy which decreases if he bangs into trees, rocks, mid-air islands or the Psi-web."

Gribbly lives on Blabgor, a world of 16 screens each 30 times larger than the display area. The little creature is highly intelligent and so only requires one foot. That intelligence also gives him the ability to levitate. And there's no violence on Blabgor; Gribbly gets rid of nasties by blowing bubbles at them.

"Unusual and interesting graphics abound in this game," comments Serbert. "Landscape features include cascading waterfalls, floating lakes and flooded caverns, but it is the sprites which really impress. Seon is a spine-chilling, crab-like creature and the various stages of Topsy evolution include a one-propellor Seed Pod and a sort of green slinky with suction pads."



Francois says, "Beautiful multi-directional scrolling is a strong feature of the game, along with Gribbly's facial expressions, a comical smile if you are doing well and a stern frown if you are causing him pain."

For Carl Coffey, 17, of Longfield in Kent, "The graphics are fantastically designed and they seem to get better as you progress through each cave, what with waterfalls and realistic rock formations."

Neil Edwards, 15, of Bexleyheath, Kent, is complimentary too. "The graphics of Gribbly are amazingly crisp and smooth considering the amount of bouncing and mental levitation that is done."

Sound effects in Gribbly's Day Out also got some well-deserved attention. "I liked the sound of this game," says Serbert. "A pleasant tune accompanies the two title screens and the sound effects are effective. Gribbly's bouncing is very spring-like and the sound of Seon approaching is suitably horrible."

Coffey says, "The title music is catchy and the sound effects are great and most of all original, especially the little squeeks from the Gribblets."

It looks good, sounds good, but how does it play?

"The game is infuriatingly addictive and will provide a challenge for even the most experienced gamesters," says Archer. "Hovering still in mid-air requires quite a knack. But as well as being challenging, the game is still lots of fun to play."

Luci Kershaw, 13, of Teddington in Middlesex, says, "I found this quite original and, once I'd started to master the game and discovered the location of some Gribblets, I enjoyed the game tremendously."

It certainly isn't the easiest game you will ever play, as Edwards found out. "You have very little energy, which can be lost easily, so until you have had a lot of practise the games will not be too long."

But relief! Coffey says, "It is interesting to note here that the screens are selected according to your last performance, this making a change from the usual level selection."

Lengthy instructions were just a bit daunting to Archer, who says, "The writing on the introduction screen is very elaborate, perhaps too much so, as some letters are difficult to read."

Our panel's conclusions

"Once accustomed to the difficult inertia and gravity of Blabgor, there is a most entertaining game to be found that will provide many hours of **Gribblet grabbing, spider splatting fun**." — Burke

"A very good game by Hewson Consultants; **a must for those who enjoy a good hop.**" — Kershaw.

"The game is highly original and a change from the ordinary seek and retrieve games, so you will return to this light-hearted game more than any other. Because of this Gribbly's Day Out comes **highly recommended.**" — Edwards.

"GDO has **many wonderful features** and has been programmed carefully with no loose ends floating around." — Francois.

"Gribbly's Day Out certainly gets a **thumbs up** from me." — Archer.

"Such is the challenge that I returned to the C64 again, again and again. **This is one day out you shouldn't miss.**" — Serbert.

"After playing two hours solid, I suddenly realised with quivering hands and sweating joystick that this could well be an original concept in arcade game playing . . . The author, Andrew Braybrook, deserves a pat on the back for what **could be one of THE games of 1985.**" — Coffey.

Contact: Hewson Consultants Ltd, 56B Milton Trading Estate, Milton, Abingdon, Oxon OX14 4RX. Tel: 0235 832939.

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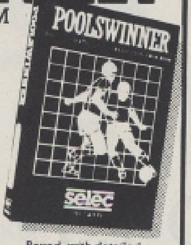

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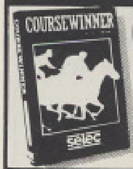

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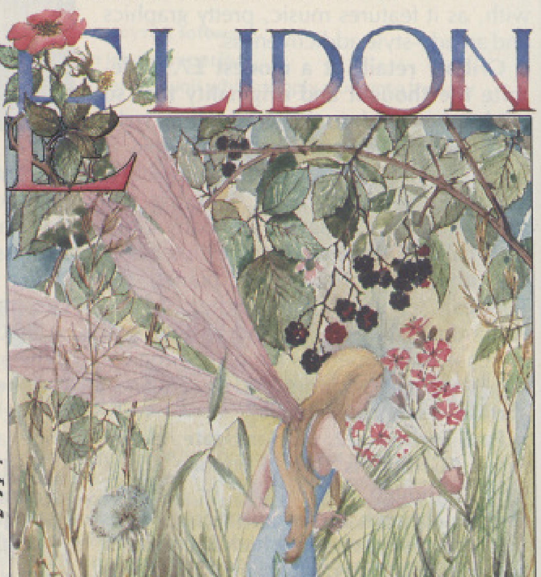

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In A View To A Kill, the action starts in Paris with the baddie, Mayday (played by Grace Jones), eliminating Bond's lunch partner before hang-gliding off the Eiffel Tower. Bond is hot in persuit — with a 'borrowed' taxi. Bond always gets his girl, of course, and the information he manages to extract from her starts him off on a race to diffuse a bomb planted in a mine in America's Silicon Valley.

We won't spoil the film by telling you the whole story, but it is a typical Bond adventure — said to be one of the best yet.

Complete our competition correctly and you could soon be on your way to find out for yourself.

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1 In From Russia With Love, (a) who played the murderous Red Grant and (b) in which fishy thriller did he subsequently star?

(a)________________________

(b)________________________

2 In You Only Live Twice, (a) the part of Bond was played by which actor, and (b) who sang the title song?

(a)________________________

(b)________________________

3 Ernst Stavro Blofeld was Bond's evil adversary in three films. (a) name each film with (b) it's respective villainous actor.

(a) Film title	(b) Actor
(i)____________	(i)____________
(ii)____________	(ii)____________
(iii)____________	(iii)____________

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Fingers on the buzzers please!

Turn your 64 into a 'University Challenge' style quizmaster with this hardware and software project by Iain Murray.

This is a project designed to simulate the scorekeeper in a quiz, and involves both software and hardware parts. A switch unit must be constructed as shown below. This should be fairly straightforward to anyone who has handled a soldering iron before, and the components will cost around £5. The program listing should then be typed in to enable you to use the unit.

In use, the program will ask for the input of the number of players, number of question types, and how the quiz is to be timed. The computer then executes a short machine code subroutine to read the buttons, and when one is pushed, either a bell or a buzzer will sound, depending on which team answered.

The scorer will then have to input whether the question was answered correctly, and which type of question it was, for scoring purposes. At the end of the quiz, a detailed breakdown of each player's performance is given to either screen or printer, along with the total score for each team.

The program was designed round a "University Challenge" type game with two teams of four (or fewer) players, but if all players were to be independent, the program could be easily modified.

a) Construction of the Switch Unit

(i) Parts list:

24 way 0.156 inch board connector to suit user port of CBM64.

Non-locking push-to-make switches (one for each player, max 8).

Lengths of two-core speaker cable (one for each switch, length to suit place of use).

35mm film canisters or drinks cups for mounting switches.

Eight resistors (any value from 200ohms to 10kilohms is suitable. The ones used in the prototype were 10kilohm, ⅓ watt).

(ii) How it Works

The circuit diagram is given in diagram e). The port input is held at +5V by the resistor until the switch is pressed, grounding the port input to 0V. This change is detected by the software and acted upon.

```
10 REM *** QUIZMASTER ***
20 REM *** BY IAIN MURRAY (C) 1985 ***
30 REM *** FOR COMMODORE COMPUTING INTERNATIONAL ***
40 POKE 53280,6:POKE 53281,6:REM BCKGND COLOUR=BLUE
50 DIM NM$(10),QV(20),QV$(20),Q(10,10,2)
60 N=54272:R1=0:R2=0
61 REM        **** SET SW FOR YOUR OWN UNIT
   (MUST BE EVEN NUMBER) ****
70 SW=8:REM ****   SW IS NUMBER OF SWITCHES
    ATTACHED - MAX=8     ****
71 REM        **** SET SW FOR YOUR OWN UNIT
    (MUST BE EVEN NUMBER) ****
74 REM [CLR]  [WHITE]  [2 DWN]  [14 RGHT]  [REV ON]  [REV OFF]
75 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒ QUIZMASTER ▒"
77 REM [5 DWN]  [13 RGHT] [UP]
78 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒PLEASE  WAIT▒"
80 FOR I=0 TO 10:FOR J=0 TO 10:FOR K=0
TO 2:Q(I,J,K)=0:NEXT K,J,I
82 PRINT "                              "
85 POKE 56579,0:REM DATA DIRECTION REGISTER
90 FOR K=N TO N+24:POKE K,0:NEXT
99 REM [CLR]  [WHITE]  [2 DWN]  [14 RGHT]  [REV ON]  [REV OFF]
110 RESTORE:C=0:FOR I=49152 TO 49181:READ A:C=C+A:POKE I,A:NEXT
119 REM [3 DWN]
120 IF C<>4022 THEN PRINT "▒▒▒DATA SUM ERROR =";4022-C
140 IF R1=1 THEN 245
149 REM [2 DWN]  [2 RGHT]
150 PRINT "▒▒▒▒HOW MANY PLAYERS ( 1 -";SW;") ?"
160 GET A$:IF A$="" THEN 160
170 A=VAL(A$):IF A>0 AND A<=SW AND A/2=INT(A/2) THEN 200
179 REM [DWN] [2 RGHT]
180 PRINT "▒▒▒NUMBER MUST BE EVEN AND LESS THAN",SW+1:GOTO 150
200 FOR PL=1 TO A/2:FOR TM=1 TO 2
209 REM [2 DWN]  [2 RGHT]  [REV ON]  [REV OFF]  [REV ON]
210 PRINT "▒▒▒▒▒TEAM";TM;"▒  ▒PLAYER";PL
219 REM [REV OFF]  [2 RGHT]
220 PRINT "▒▒▒GIVE YOUR NAME ";:INPUT NM$((PL*2)-2+TM)
229 REM [2 RGHT]
230 PRINT "▒▒PLEASE USE BUTTON NUMBER";(PL-1)*2+TM
240 NEXT TM,PL:NP=A
245 IF R2=1 THEN 320
249 REM [4 DWN]  [2 RGHT]
250 PRINT "▒▒▒▒▒▒HOW MANY QUESTIONS OF DIFFERENT VALUE"
260 INPUT "  ARE THERE";QV
265 IF QV<1 OR QV>9 OR QV<>INT(QV) THEN 250
268 IF QV=1 THEN QV$(1)="":QV(1)=1:GOTO 320
269 REM [2 DWN]  [2 RGHT]
270 FOR K=1 TO QV:PRINT "▒▒▒▒GIVE NAME OF QUESTION TYPE";K
280 INPUT QV$(K)
289 REM [2 DWN]  [2 RGHT]
290 PRINT "▒▒▒▒GIVE POINTS VALUE OF QUESTION TYPE";K
300 INPUT QV(K)
310 NEXT K
319 REM [4 DWN]  [2 RGHT]
320 PRINT "▒▒▒▒▒▒IS THE CONTEST OVER A SET TIME OR A"
329 REM [2 RGHT]
330 PRINT "▒▒SET NUMBER OF QUESTIONS (T/N) ?"
340 GET A$:IF A$="T" THEN 390
350 IF A$<>"N" THEN 340
```

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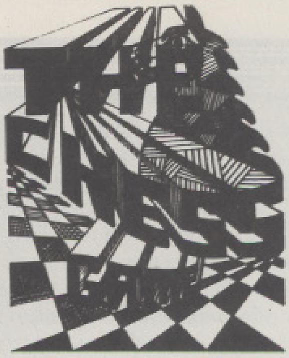

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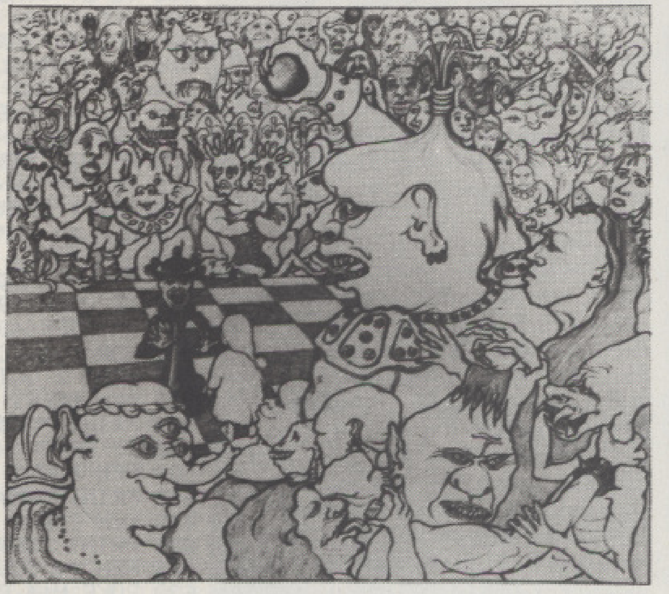

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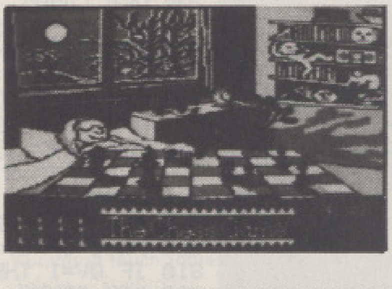

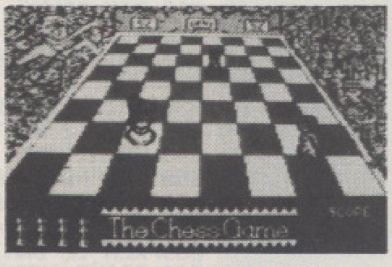

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(iii) Construction of the switch unit

1) Fit two polarising keys to the port connector as illustrated. This is to stop you fitting the connector the wrong way round.

2) Cut your wire to the lengths desired for the switches (the prototype's were cut to 2 metres). Split and strip the wire at one end and solder onto the switches.

3) Split and strip the free end of the wire. Collect one wire from each of four of the switches together, twist and solder. Repeat this for the other set of four. These two twisted wires should now each be soldered to one of the end pins on the bottom row of the connector, one bunch to pin A and one to pin N.

4) Solder the remaining wires to pins C-L. If you are using less than 8 switches, then connect up from pin C and leave the higher pins unused.

5) Now solder one resistor to each of pins C-L. The resistor legs should be trimmed to about 1cm long, and care should be taken to ensure that the wire already soldered to these connector pins does not become disconnected. Note from diagram b) that the resistors should stick straight out behind the connector.

6) Bend the free legs of the resistors over so that they touch the adjacent one (see diagram c), and solder all the legs together. Note that all eight resistors MUST be fitted no matter how many switches you are using. Now solder a short length of cable to the common resistor connection, and solder the other end to the +5V pin (pin 2) on the top row of the connector.

7) Cut a hole in each of your switch mountings (35mm film canistersd are ideal for this) to fit the switches, as well as a slot in the base to pass out the connecting wire.

8) You may like to fit some sort of handle to the unit to make it easier to remove from the user port. I had some potting compound, and fitted a plastic cast handle round the unit (see photos). The switch unit is now complete.

b) The Program

(i) How It Works

10-90	Initial set up and title
110-120	Read and store machine code data
140-430	Input section for player and question details
500	Check for "Out of time"
505-530	Print "waiting" message on screen
540	Enter machine code to scan button and keyboard. A return is made when a switch or key is pressed
545-620	Check who pressed and display
630-660	Team 1 so sound buzzer
700-740	Team 2 so ring bell
800-890	Ask for question type and whether it was answered correctly
900-960	Increment question data stores, question number and go to next one

```
359 REM [2 DWN]  [2 RGHT]
360 INPUT "▓▓▓▓HOW MANY QUESTIONS ";NQ
370 L=0:IF NQ<1 OR NQ<>INT(NQ) THEN 360
380 GOTO 410
389 REM [2 DWN]  [2 RGHT]
390 INPUT "▓▓▓▓HOW LONG (MINUTES) ";ET
400 L=1:IF ET<1 OR ET<>INT(ET) THEN 400
409 REM [2 DWN]  [2 RGHT]  [REV ON]  [REV OFF]
410 PRINT "▓▓▓▓PRESS ▓ SPACE ▓ TO BEGIN"
420 GOSUB 5010
430 TI$="000000":QC=1
499 REM *** QUESTION LOOP ***
500 TL=ET-(VAL(TI$)/60):IF L=1 AND TL<0 THEN QC=QC-1:GOTO 1000
504 REM [CLR]  [4 DWN]  [2 RGHT]
505 PRINT "▓▓▓▓▓▓▓QUESTION";QC
510 TL=(INT(TL*100))/100
514 REM [DWN]  [2 RGHT]
515 IF L=1 THEN PRINT "▓▓▓TIME LEFT";TL;"MINUTES"
519 REM [4 DWN]  [10 RGHT]  [REV ON]  [REV OFF]
520 PRINT "▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ WAITING FOR ANSWER ▓"
529 REM [4 DWN]  [4 RGHT]  [REV ON]  [REV OFF]
530 PRINT "▓▓▓▓▓▓▓▓▓ PRESS A KEY IF NO ANSWER GIVEN ▓"
539 REM ** JUMP TO MACHINE CODE TO SCAN BUTTONS AND KEYBOARD **
540 SYS 49152
545 IF L=1 AND (VAL(TI$)/60)>ET THEN 1000
550 IF PEEK(49409)<>64 THEN 800
560 PK=PEEK(49408)
570 FOR K=0 TO NP-1:IF (PK AND 2↑K)=0 THEN PA=K+1:GOTO 590
580 NEXT K:GOTO 540
589 REM [CLR]  [2 DWN]  [2 RGHT]
590 PRINT "▓▓▓▓▓QUESTION ANSWERED BY"
600 IF PA/2=INT(PA/2) THEN 700
609 REM [DWN]  [2 RGHT]  [REV ON]  [REV OFF]
610 PRINT "▓▓▓▓ TEAM 1 "
619 REM [DWN]  [2 RGHT]  [REV ON]  [REV OFF]
620 PRINT "▓▓▓▓ ";NM$(PA);" ▓"
629 REM ** SOUND BUZZER **
630 POKE N+4,0:POKE N+5,0:POKE N,0
640 POKE N+24,15:POKE N+5,20:POKE N+4,33:POKE N+6,128
650 POKE N+1,8:POKE N,97:FOR TT=0 TO 400:NEXT TT:POKE N+24,0
660 GOTO 810
699 REM [DWN]  [2 RGHT]  [REV ON]
700 PRINT "▓▓▓▓ TEAM 2 "
709 REM [DWN]  [2 RGHT]  [REV ON]  [REV OFF]
710 PRINT "▓▓▓▓ ";NM$(PA);" ▓"
719 REM ** SOUND BELL **
720 POKE N+4,0:POKE N+5,0:POKE N,0
730 FOR S=15 TO 0 STEP -1:POKE N+24,S:POKE
    N+5,20:POKE N+4,65:POKE N+6,128
740 POKE N+2,250:POKE N+3,7:POKE N+1,33:POKE
     N,135:NEXT S:GOTO 810
799 REM [CLR]  [2 DWN]  [10 RGHT]
800 PRINT "▓▓▓▓▓▓▓▓▓▓▓▓▓QUESTION UNANSWERED"
805 PA=0:IF QV=1 THEN QT=1:GOTO 900
810 IF QV=1 THEN QT=1:GOTO 860
819 REM [DWN]
820 FOR K=1 TO QV:PRINT "▓";K;"  ";QV$(K);TAB(25);QV(K):NEXT
825 PRINT "▓";QV+1;"  BUTTON PRESSED ACCIDENTALLY"
829 REM [2 DWN]  [2 RGHT]
830 PRINT "▓▓▓▓WHICH TYPE OF QUESTION WAS THAT"
839 REM [2 RGHT]
840 PRINT "▓▓K 1 -";QV+1;") ?"
850 GET A$:A=VAL(A$):IF A=QV+1 THEN 500
852 IF A<1 OR A>QV THEN 850
855 QT=A:IF PA=0 THEN 900
859 REM [2 DWN]  [2 RGHT]
860 PRINT "▓▓▓▓WAS THE QUESTION ANSWERED CORRECTLY"
870 PRINT "  (Y/N) ?"
880 GET A$:IF A$="N" THEN 910
890 IF A$<>"Y" THEN 880
900 Q(PA,QT,1)=Q(PA,QT,1)+1:IF PA>0 THEN Q(9,QT,1)=Q(9,QT,1)+1
905 GOTO 950
910 Q(PA,QT,0)=Q(PA,QT,0)+1:Q(0,QT,0)=Q(0,QT,0)+1
950 QC=QC+1:IF L=0 AND QC>NQ THEN 1100
960 GOTO 500:REM NEXT QUESTION
998 REM ** OUT OF TIME **
999 REM [CLR]  [4 DWN]  [13 RGHT]  [REV ON]  [REV OFF]
1000 PRINT "▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓ OUT OF TIME ▓"
1009 REM ** SOUND GONG **
1010 POKE N+4,0:POKE N+5,0:POKE N,0
1020 FOR S=15 TO 0 STEP -1:POKE N+24,S:POKE N+5,20:
     POKE N+6,128:POKE N+4,65
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Business

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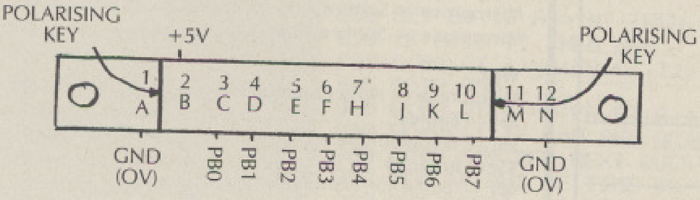
1000-1080	Out of time so sound gong
1100-1370	Print out scoreboard
1400-1500	Ask if re-run required
5000-5020	Wait for space press
9000-9020	Data for machine code routine

(ii) Variables used

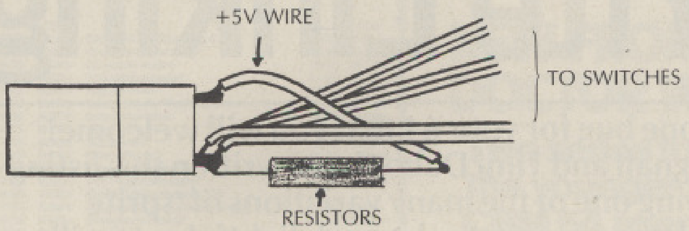
N	— Sound pointer
C	— Data counter
QC	— Question counter
NM$()	— Players names
QV$()	— Question names (Hard Easy, Bonus, etc.)
SW	— Number of switches attached
NQ	— Number of questions to be asked
ET	— Time of competition
TL	— Time left
PK	— Value from user port
Q()	— Questions answered data storage
PA	— Player who answered
NP	— Number of players
TS()	— Team scores

```
1030 POKE N+2,200:POKE N+3,14:POKE N+1,6:POKE N,167
1040 POKE N+12,130:POKE N+13,66:POKE N+11,129
1050 POKE N+8,6:POKE N+7,167:POKE N+16,129
1070 FOR TT=1 TO 30:IF S>4 THEN POKE N+24,S-4
1080 NEXT TT:POKE N+24,S:NEXT S:GOTO 1110
1098 REM ** ALL QUESTIONS DONE **
1099 REM [CLR]  [4 DWN]  [7 RGHT]  [REV ON]  [REV OFF]
1100 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒ ALL QUESTIONS NOW ASKED ▒"
1109 REM [4 DWN]  [5 RGHT]  [REV ON]  [REV OFF]
1110 PRINT "▒▒▒▒▒▒▒▒▒▒PRESS ▒ SPACE ▒ FOR SCOREBOARD"
1120 GOSUB 5010
1129 REM [CLR]  [2 DWN]  [2 RGHT]
1130 PRINT "▒▒▒▒▒OUTPUT TO SCREEN OR PRINTER (S/P) ?"
1140 F=3:GET A$:IF A$="S" THEN 1160
1150 F=4:IF A$<>"P" THEN 1140
1159 REM [DWN]
1160 OPEN 1,F:PRINT#1,"▒";QC-1;"QUESTIONS WERE ASKED"
1170 FOR K=1 TO NP:PRINT#1:PRINT#1
1180 IF K/2=INT(K/2) THEN PRINT#1,"TEAM 2  PLAYER";
     K/2;"     ";:GOTO 1200
1190 PRINT#1,"TEAM 1  PLAYER";(K+1)/2;"      ";
1200 PRINT#1,NM$(K):FOR W=1 TO QV:PRINT#1
1210 PRINT#1,"QUESTION TYPE";W;"- ";QV$(W);" VALUE";QV(W)
1220 PRINT#1,"    CORRECT -";Q(K,W,1);
1230 PRINT#1,"    WRONG -";Q(K,W,0)
1240 NEXT W:GOSUB 5000:NEXT K
1270 FOR K=1 TO QV:PRINT#1:PRINT#1,"QUESTION TYPE";K;"- ";QV$(K)
1280 PRINT#1,"    TOTAL ASKED -";Q(0,K,0)+Q(0,K,1)+Q(9,K,1)
1285 PRINT#1,"    UNANSWERED -";Q(0,K,1)
1290 PRINT#1,"    ANSWERED CORRECT -";Q(9,K,1)
1295 PRINT#1,"    ANSWERED WRONG -";Q(0,K,0)
1297 GOSUB 5000
1300 NEXT K:PRINT#1:PRINT#1
1310 TS(1)=0:TS(2)=0:FOR K=1 TO NP
1320 T=1:IF K/2=INT(K/2) THEN T=2
1330 FOR G=1 TO QV
1340 TS(T)=TS(T)+(Q(K,G,1)*QV(G)):NEXT G,K
1350 PRINT#1,"TEAM 1 TOTAL SCORE =";TS(1)
1360 PRINT#1:PRINT#1,"TEAM 2 TOTAL SCORE =";TS(2)
1370 PRINT#1:PRINT#1:CLOSE 1
1399 REM [4 DWN]  [6 RGHT]  [REV ON]  [REV OFF]
1400 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒ PROGRAM EXECUTION COMPLETE ▒"
1409 REM [3 DWN] [6 RGHT]
1410 PRINT "▒▒▒▒▒▒▒▒▒ANOTHER GAME (Y/N) ?"
1420 GET A$:IF A$="N" THEN END
1430 IF A$<>"Y" THEN 1420
1439 REM [2 DWN] [4 RGHT]
1440 PRINT "▒▒▒▒▒▒SAME PLAYERS (Y/N) ?"
1450 R1=1:GET A$:IF A$="Y" THEN 1470
1460 R1=0:IF A$<>"N" THEN 1450
1469 REM [2 DWN] [4 RGHT]
1470 PRINT "▒▒▒▒▒▒SAME QUESTION TYPES (Y/N) ?"
1480 R2=1:GET A$:IF A$="Y" THEN 70
1490 R2=0:IF A$<>"N" THEN 1480
1500 GOTO 70
4998 REM *** PAUSE FOR SPACE PRESS ***
4999 REM [3 DWN]  [REV ON]  [REV OFF]
5000 PRINT "▒▒▒PRESS ▒ SPACE ▒ TO CONTINUE"
5010 GET A$:IF A$=" " THEN RETURN
5020 GOTO 5010
8999 REM *** DATA FOR MACHINE CODE ***
9000 DATA 173,1,221,201,255,240,9,141,0,193
9010 DATA 169,64,141,1,193,96,32,228,255,240
9020 DATA 235,141,1,193,169,0,141,0,193,96

READY.
```

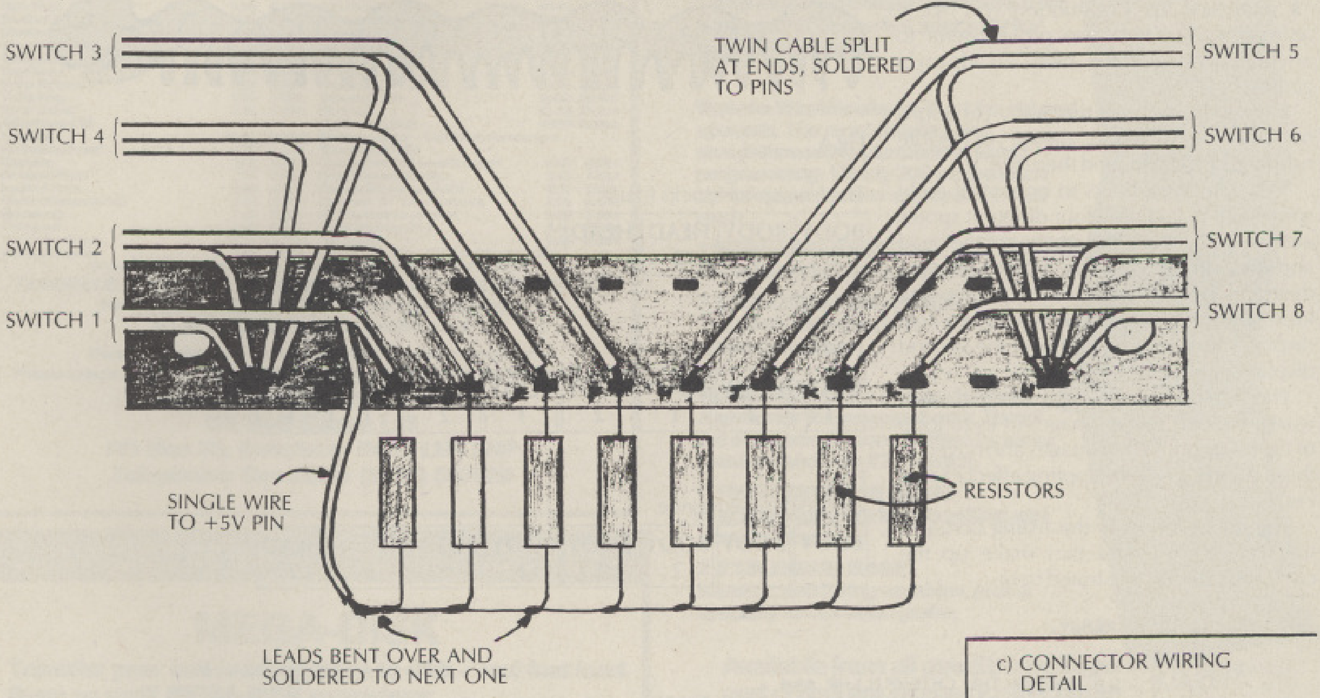


a) USER PORT CONNECTOR RETAIL (LOOKING ON TO SOLDERING PINS)

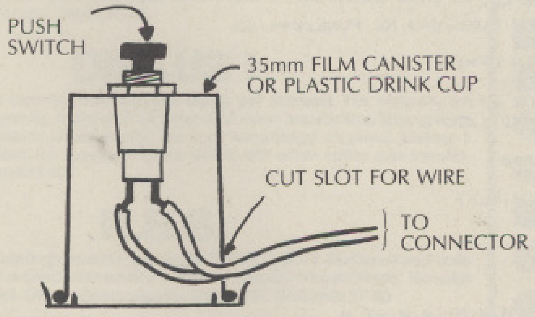

+5V WIRE
TO SWITCHES
RESISTORS

b) SIDE VIEW OF CONNECTOR WIRING

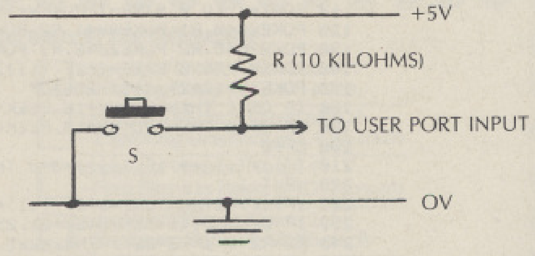
WIRES AND RESISTORS POSITIONED FOR CLARITY ONLY. ACTUAL LAYOUT IS AS ABOVE IN B) ABOVE


SWITCH 3
SWITCH 4
SWITCH 2
SWITCH 1
TWIN CABLE SPLIT AT ENDS, SOLDERED TO PINS
SWITCH 5
SWITCH 6
SWITCH 7
SWITCH 8
SINGLE WIRE TO +5V PIN
RESISTORS
LEADS BENT OVER AND SOLDERED TO NEXT ONE

c) CONNECTOR WIRING DETAIL


PUSH SWITCH
35mm FILM CANISTER OR PLASTIC DRINK CUP
CUT SLOT FOR WIRE
TO CONNECTOR

d) SAMPLE SWITCH MOUNTING


+5V
R (10 KILOHMS)
TO USER PORT INPUT
S
OV

e) CIRCUIT FOR SWITCH UNIT (OTHERS IN PARALLEL)

Sprite Linking

Here's one bug for your 64 that you will welcome! Tony Mangnall and Timi Dabor have written this listing showing one of the many variations of 'sprite running'. When run, it displays a delightful caterpillar creeping across the screen

This listing will not only amuse anyone interested in Commodore 64 sprite animation, but will also prove useful to anyone writing their own arcade-style games.

It shows just one of the many variations on the much loved theme of 'sprite running'. Type it in, and then 'run' it.

This display appears to consist of eight sprites but in fact only four different sprites are used. There are two images of the head and two images of the body. See the diagrams on this page: Fig A depicts the four sprite blocks; fig B show the first display sequence; fig C shows the second display sequence.

The screen display will alternate between the two sets of images at each loop of the program. When images are moved in this manner, a type of rippling effect can be created.

The data section of the listing contains the four sets of data that make up the caterpillar design illustrated here.

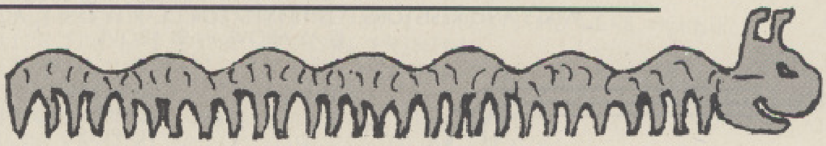


Fig A

The four sprite blocks (data)

BODY 2	BODY 1	HEAD 2	HEAD 1

Fig B
1st display sequence

BODY 1	BODY 2	BODY 1	BODY 2	BODY 1	BODY 2	BODY 1	HEAD 1

Fig C
2nd display sequence

BODY 2	BODY 1	BODY 2	BODY 1	BODY 2	BODY 1	BODY 2	HEAD 2

```
READY.

10 REM*** THE CATERPILLAR ***
20 REM*** BY  TONY MANGNALL / TIMI DABOR   ( C. 1985 ) ***
30 PRINT"♥":POKE53280,12:POKE53281,0
40 V=53248
50 FORI=0TO7:POKE V+39+1,13:T(I)=160-1*20:NEXT
60 R1=223:R2=225:R3=226:Y=140
70 FORN=0TO3:T=(223+N)*64:FORI=0TO62
80 READQ:POKET+I,Q:NEXTI,N
110 FORI=7 TO 0 STEP-1:POKEV+1+(I*2),Y:NEXT
120 POKE2040,R1:POKE2041,R2:POKE2042,R3:POKE2043,R2:POKE2044,R3
130 POKE2045,R2:POKE2046,R3:POKE2047,R2
140 FORI=7 TO 0 STEP-1:IF T(I)>255 THEN OF=1
170 POKE V+(I*2),T(I)-256*OF
180 IF OF=1 THEN POKEV+16,PEEK(V+16) OR 2↑I
190 IF OF=0 THEN POKEV+16,PEEK(V+16) AND (255-2↑I)
200 OF=0
210 T(I)=T(I)+4:IF T(I)>=348 THEN T(I)=0
220 NEXT I
225 IFT(7)=0THENFORI=0TO7:T(I)=160-I*20:NEXT
230 IF G=0ANDI<8THENPOKEV+21,255:G=1
240 R2=R2+1:IFR2=227THENR2=225
250 R3=R3+1:IFR3=227THENR3=225
260 GOTO120
300 REM  **** DATA ****
330 DATA 0,57,192,0,57,192,0,51,0,0,51,0,0,51,0,0,27,0
340 DATA 0,31,128,0,63,224,224,251,240,253,255,200,255,0,68,255,255,196
350 DATA 255,255,254,247,252,253,247,252,253,247,252,254,251,254,60,255,255,136
360 DATA 63,159,240,0,0,224,0,0,0
370 DATA 0,115,128,0,115,128,0,99,0,0,51,0,0,25,128,0,25,128
380 DATA 0,63,128,0,127,192,224,251,240,253,255,200,255,15,136,255,255
390 DATA 136,255,255,252,223,252,246
400 DATA 191,252,246,191,252,254,223,254,104,255,255,24,127,63,240,0,3,192
410 DATA 0,0,0
420 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,31,192,0,127,248,1,253,254
430 DATA 7,126,255,31,191,123,127,223,125,239,223,254
440 DATA 247,255,255,251,255,255,251,204,255,254,204,127,124,204,109,108,108
450 DATA 204,102,108,198,195,102,198,195,54,198
460 DATA 0,0,0,0,0,0,0,0,0,0,0,0,252,0,3,255,0,7,127,224,15,187,248
470 DATA 31,189,255,63,190,239,111,255,247,247,255,251
480 DATA 247,255,251,255,204,255,254,204,127,254,204,111
490 DATA 124,204,109,109,152,216,109,153,152,61,179,48,61,179,24

READY.
```

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Get your back-up

Clive Emberey comes up with a way to take the hardwork out of backing up your programs (you do keep backups don't you?!). The only resource required is time.

Two programs are required to do the job. The first is a BASIC loader for the machine code and the second is a BASIC driver which calls the machine code as required. When you have typed in both programs correctly, and SAVEd them, they will allow you to copy a cassette to disk or disk (or part of) to cassette. Once running you've time to go and take the dog for a walk, or in my case both the cat and the dog. Unfortunately the cat only drinks shorts so I don't backup too often as it proves expensive.

The programs only backup program files. If you wish to do the same for sequential files then it is simply a matter of reading a byte then writing a byte until STATUS indicates the end of the file has been reached. The maximum size of program which can be handled is about 34K. It is unlikely your programs will be that big as it doesn't leave much room for variables.

The two programs illustrate well the combination of BASIC and machine code, the machine code accomplishing what BASIC never could and the BASIC simplifying the production of the interactive part which is not so easy in machine code. The programs will also backup machine code programs of less than 34K.

To use the facility run the machine code loader. This, by the way, is easily relocated if $C000 doesn't suit. You would, of course, have to change the SYS calls in the BASIC program if you did so. It performs four functions:

i) LOAD from cassette
ii) SAVE to cassette
iii) LOAD from disk
iv) SAVE to disk

The entry points are easily worked out from the SYS calls. The KERNAL entry points are not used as to load one BASIC program from another simply overwrites the one present in memory. To overcome this problem a relocated load is always carried out to $1800 (see line 100 of BASIC program) which is above the set top of BASIC. This could in fact be done using the KERNAL LOAD. However, the program has to be saved with a relocated SAVE so that it will reload at the correct address, a function which is not present.

The problem is easily solved as the KERNAL LOAD and SAVE are two-stage operations. The first is to read or write the file's details (name, load address and ID for tape). The second is to read or write the RAM image. The technique used is to call each of these routines separately, but on route adjust the load address. That's probably enough information for anyone who wishes to get into the exact workings of the code.

The loader

So on to the BASIC driver. A few general points first. It is important to avoid sequential files. On disk these are marked with an extension type of SEQ. On tape the header has an ID of 4 (828 — the first byte of TBUFFR). Files may be saved to tape without specifying a file name. This will cause chaos on your disk if you try to save them. All unnamed files must be given a default name before saving.

To avoid errors when saving with an existing file of the same name already present it must be first deleted (so bear this in mind). File names are limited to 16 characters on disk and, for practical purposes, also on tape (on tape the name can extend the full length of the buffer-5 and is a useful way of incorporating machine code in a header, eg fast loading systems).

When copying to disk the name must be 'chopped' to 16 characters maximum. Saving a file to tape with a secondary address of 2 writes and end of tape marker. Attempts to read beyond this under program control will throw you out of the program. You can of course wind the tape past such a point and continue. Though why someone would put an end of tape marker then save programs after it I fail to understand! This marker writes at the end of the program a duplicate of the header, but instead of an ID of 1 it has an ID of 5.

```
1 DATA 32, 44, 247, 173, 60, 3, 133, 255, 169, 0, 133
2 DATA 193, 169, 24, 133, 194, 56, 173, 63, 3, 237
3 DATA 61, 3, 170, 173, 64, 3, 237, 62, 3, 168
4 DATA 24, 138, 101, 193, 133, 174, 152, 101, 194, 133
5 DATA 175, 32, 162, 245, 165, 255, 141, 60, 3, 96
6 DATA 32, 183, 247, 169, 0, 133, 193, 169, 24, 133
7 DATA 194, 56, 173, 63, 3, 237, 61, 3, 170, 173
8 DATA 64, 3, 237, 62, 3, 168, 24, 138, 101, 193
9 DATA 133, 174, 152, 101, 194, 133, 175, 32, 124, 246
10 DATA 96, 169, 96, 133, 185, 169, 1, 141, 60, 3
11 DATA 133, 184, 169, 8, 133, 186, 169, 0, 133, 195
12 DATA 133, 147, 169, 65, 133, 187, 169, 3, 133, 188
```

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```
13 DATA 169, 24, 133, 196, 164, 183, 32, 175, 245, 32
14 DATA 213, 243, 165, 186, 32, 9, 237, 165, 185, 32
15 DATA 199, 237, 32, 19, 238, 141, 61, 3, 32, 19
16 DATA 238, 141, 62, 3, 32, 232, 244, 165, 174, 141
17 DATA 63, 3, 56, 165, 175, 233, 24, 141, 64, 3
18 DATA 24, 173, 61, 3, 109, 63, 3, 141, 63, 3
19 DATA 173, 62, 3, 109, 64, 3, 141, 64, 3, 96
20 DATA 169, 97, 133, 185, 169, 1, 133, 184, 169, 8
21 DATA 133, 186, 169, 65, 133, 187, 169, 3, 133, 188
22 DATA 165, 185, 164, 183, 32, 213, 243, 32, 143, 246
23 DATA 165, 186, 32, 12, 237, 165, 185, 32, 185, 237
24 DATA 169, 0, 133, 172, 169, 24, 133, 173, 56, 173
25 DATA 63, 3, 237, 61, 3, 133, 174, 173, 64, 3
26 DATA 237, 62, 3, 133, 175, 24, 169, 24, 101, 175
27 DATA 133, 175, 173, 61, 3, 32, 221, 237, 173, 62
28 DATA 3, 160, 0, 32, 33, 246, 96, 255, 255, 0,33424
29 FOR I=49152 TO 49432:READ A:POKE I,A:B=B+A:NEXT I
30 READ A:IF B<>A THEN PRINT"DATA ERROR"
```

Down to the specifics with the usual line by line description:

Line	Action
100	Lower top of memory.
110	Names into P$() set to 20, size into C%(). Experiment to find the upper limit to these.
120-150	Options and carry them out.
160	Download files selected at 140 to tape.
170	Set default for unnamed files.
180	Download files to disk.
190	Print all files saved to disk. Called by an EOT marker found or should be actioned by a GOTO 190 if no more files on tape.
210-220	Wait subroutine.
230-280	Subroutine to read ID and name from TBUFFR.
290-480	Subroutine to read directory and allow marking for copying if a PRoGram file. The calculation of length of cassette required is based on 4K taking about 90 seconds to save. Remember the 'C' size is for both sides of a cassette and this is why the value has been doubled.
490-540	Disk to tape. The file name is set up in TBUFFR each time.
550-650	Tape to disk.
550	Entry to read any header.
560	If sequential skip it.
565	If end of tape then print list.
570	Read RAM.
580	If no name use default plus next number.
600-650	Scratch file and save it.

The program

There's plenty you can do to this program as it has been left in its crude state. The obvious is to add error checking and sequential file copying.

Before you reject tapes out of hand just sit down and think about the relative costs and merits of using tapes and disks as backups.

```
*******Editor-this is called COPYB on disk******

100 POKE52,24:POKE56,24:CLR
110 DIMP$(20),C%(20)
120 PRINT"[CLS]BACKUP TAPE/DISK":PRINT"[CD]1 DISK TO TAPE"
130 PRINT"[CD]2 TAPE TO
DISK":INPUT"[CD]SELECT";O:IFO<1ORO>2GOTO120
140 IFO=1THENGOSUB290
150 IFO=2GOTO170
160 FORB=1TOII:GOSUB490:NEXTB:END
170 INPUT"[CD]DEFAULT FOR UNAMED FILES";DF$
180 GOSUB 550:GOTO180
190 PRINT"[CLS]FILES COPIED[CD]"
200 FORI=1TOBB:PRINTP$(I):NEXTI:END
210 GETY$:IFY$=""GOTO210
220 RETURN
230 Y=PEEK(828)
240 IFY=4THENRETURN
250 N$="":FORI=848TO833STEP-1:X=PEEK(I)
260 IFX=32ANDN$=""GOTO280
270 N$=CHR$(X)+N$
280 NEXTI:RETURN
290 PRINT"[CLS]";:OPEN1,8,0,"$0":GET#1,Y$,Y$
300 I=0:GET#1,Y$,Y$,Y$,X$:IFY$<>""THENI=ASC(Y$)
310 IFX$<>""THENI=I+ASC(X$)*256
320 B=I
```

```
330 PRINTRIGHT$("[2SPC]"+STR$(I),3);" ";:I=0:B$="":T$=""
340 GET#1,Y$:IFSTGOTO450
350 IFY$=CHR$(34)THENI=I+1:PRINTCHR$(34);:GOTO340
360 IFI=0GOTO340
370 IFI=1THENPRINTY$;:B$=B$+Y$:GOTO340
380 IFI=2THENPRINTTAB(22);:I=I+1
390 IFI=3ANDY$=" "GOTO340
400 IFY$<>""THENPRINTY$;:T$=T$+Y$:GOTO340
410 IFT$="PRG"THENINPUT" [REV]COPY[OFF] Y/N";Y$
420 IFY$="Y"THENII=II+1:P$(II)=B$:C%(II)=B:GOTO440
430 PRINT
440 IFST=0GOTO300
450 PRINT "BLOCKS FREE":CLOSE 1:TB=0
460 PRINT"[CLS]FILES TO
COPY[CD]":FORI=1TOII:PRINTC%(I)/4,P$(I):TB=TB+C%(I):NEXTI
470 PRINT:PRINTTB/4;"K TO COPY SO USE >C"TB/4*2*1.5/4"TAPE"
480 GOSUB210:RETURN
490 FORI=1TOLEN(P$(B)):POKE832+I,ASC(MID$(P$(B),I,1)):NEXTI
500 FORI=833+LEN(P$(B))TO1019:POKEI,32:NEXTI
510 POKE183,LEN(P$(B)):SYS49244
520 PRINT:SYS49203
530 SYS49206
540 RETURN
550 SYS63276
560 GOSUB230:IFY=4GOTO650
565 IFY=5GOTO190
570 SYS49155
580 IFN$=""THENB=B+1:N$=DF$+STR$(B)
590 BB=BB+1:P$(BB)=N$
600 OPEN15,8,15,"S0:"+N$:CLOSE15
610 POKE183,LEN(N$)
620 FORI=1TOLEN(P$(BB)):POKE832+I,ASC(MID$(P$(BB),I,1)):NEXTI
630 FORI=833+LEN(P$(BB))TO1019:POKEI,32:NEXTI
640 SYS49343
650 RETURN
```

Enhancements

To allow the backing up of a number of files without any action from the user only disk to tape interchange is supported. However, by using the existing machine code and adding a few extra BASIC subroutines the program can be made to work from tape to tape and disk to disk. This will only allow the backing up of single files, of course.

Following our principle of giving the foundation from which you can build, we do not provide a complete answer. However, here are a few hints to help you on your way to do a disk to disk copy. Lines 490-510 set up the disk file name (P$()) and perform the load. Rather than then calling the 'save to tape' option (lines 520 and 530 — remember it is a two stage process), simply call the save to disk option (line 640). Remember to allow a pause to switch disks and, if you wish, scratch a file of the same name already present to avoid disk errors. Tape to tape is just as easy!

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Information is divided up on the disk within tracks and sectors. There are 35 tracks to a disk each consisting of an area between two concentric circles. These are then sub-divided into sectors and each sector is divided into 256 bytes.

For this program we are only interested in track 18. This is where our directory lives. Track 18 sector 0 contains the name of the diskette, the ID number and the familiar '2A'. Track 18 sector 1 onwards contains the names of the programs and their locations on the disk. This is the part Plus Eight will 'fiddle' with. Each file entry occupies 30 bytes. Listed below is a description of those bytes.

BYTE 0 File type. Where a 1 would designate a sequential file, a 2 a program file etc, etc.

BYTES 1-2 The Track and sector of the first data block.

BYTES 3-18 File name padded with shifted spaces.

BYTES 19-27 I won't cover these as they don't affect us at this point.

BYTES 28-29 Number of blocks in a file.

The bytes that concern us are bytes 3-18. This is where the filename lives. A typical view of this block would look something like this:

```
BYTE:       0  1  2  3  4  5  6  7  8  9  10 11 12 13 14 15 16 17 18 19 20
HEX:        00 00 82 11 05 57 45 44 47 45 A0 A0 A0 A0 A0 A0 A0 A0 A0 A0 A0 00 00
ASCII:                     W  E  D  G  E
```

It would appear in a directory something like this: '17 "wedge"   prg'

As you can see the quotes do not appear amongst the data. These are taken care of by the operating system which relies on two pieces of information, the start location of each filename (which is always the same) and the first 'A0'.

A0 in decimal is 160 or may be more familiar to you as an inverse or shifted space and these are used to fill the remaining spaces in a filename (16 chars long).

It is because of the operating systems method of detecting the end of a filename that the program is able to add the ',8:' etc. All the program does is to load the directory using the block read commands, check to see if there is enough room to add the ',8:' or ',8,1:', leave a single 'A0' after the filename to fool the operating system, change the next 3 or 5 A0's (depending on type selected) to ,8 or whatever and then write this information back to the disk using the block write command. Eh Voila!

```
0 REM ******* PLUS EIGHT -- IAN BENNETT -- 18TH JAN 1984 *******
10 P1$=CHR$(147)+CHR$(17)+CHR$(29)
20 P2$=CHR$(17)+CHR$(29)
30 B$=CHR$(160):E$=CHR$(160)+CHR$(44)+CHR$(56)+CHR$(44)+CHR$(49)+CHR$(58)
40 EX$=B$+B$+B$+B$+B$+B$+B$+B$+B$+B$:E$=E$+EX$
50 G$=CHR$(160)+CHR$(44)+CHR$(56)+CHR$(58):G$=G$+EX$+B$+B$+B$
60 FOR Z=1 TO 8:READ A(Z):NEXT
70 DATA 5,37,69,101,133,165,197,229
80 OPEN 15,8,15,"I"
90 OPEN 5,8,5,"#"
100 T=18:S=1
110 PRINT#15,"U1:";5;0;T;S:T1=T:S1=S
120 PRINT#15,"B-P";5;0
130 PRINT P1$CHR$(18)" ** DIRECTORY ** "CHR$(146)"  TRACK";T" SECTOR";S
140 PRINT:PRINT:GET#5,T$,S$:T=ASC(T$+CHR$(0)):S=ASC(S$+CHR$(0))
150 FOR L=1 TO 8:PRINT L;
160 PRINT#15,"B-P";5;A(L)
170 FOR X=1 TO 16
180 GET#5,A$
190 PRINT A$;
200 NEXT X :PRINT:PRINT
210 NEXT L
220 PRINT P2$ CHR$(18)" SELECT NO. OR HIT 'N' FOR NEXT BLOCK " CHR$(146)
230 IF S=255 THEN PRINT CHR$(19) P2$ TAB(20)"END OF FILE            ":GOTO 250
240 FOR D=1 TO 200:NEXT:POKE 198,0
250 GET O$:IF O$="" THEN 250
260 IF O$="N" AND S=255 THEN T=18:S=1:GOTO 110
270 IF O$="N" THEN 110
280 IF O$="Q" THEN 560
290 O=VAL(O$):IF O<1 OR O>8 THEN 250
300 PRINT P1$ TAB(9)" ***  * OPTIONS *  ***"
```

```
310 PRINT P2$ TAB(15) "1) "CHR$(18)" ,8:   "
320 PRINT P2$ TAB(15) "2) "CHR$(18)" ,8,1:"
330 GET I$:IF I$=""THEN 330
340 IF I$<>"1" AND I$<>"2" THEN 330
350 I=VAL(I$)
360 PRINT P1$
370 PRINT#15,"U1:";5;0;T1;S1
380 PRINT#15,"B-P";5;A(O)
390 R$="":FOR X=1 TO 16
400 GET#5,A$:IF A$<>CHR$(160) THEN R$=R$+A$
410 NEXT X
420 R=LEN(R$):IF R>10 THEN PRINT"FILENAME IS TOO LONG":GOTO 510
430 IF R<1THEN PRINT"NO SUCH FILENAME ???":GOTO 510
440 IF I=1 THEN R$=R$+LEFT$(G$,16-R)
450 IF I=2 THEN R$=R$+LEFT$(E$,16-R)
460 PRINT P1$"NEW FILENAME IS ";R$
470 PRINT#15,"U1 5 0";T1;S1
480 PRINT#15,"B-P";5;A(O)
490 FOR H=1 TO 16:PRINT#5,MID$(R$,H,1);:NEXT
500 PRINT#15,"U2 5 0";T1;S1
510 PRINT P2$"FINISHED - "R$"
520 PRINT P2$"HIT 'C' TO CONTINUE"
530 GET C$:IF C$="" THEN 530
540 IF C$="C" THEN 100
550 INPUT#15,A,B$,C,D
560 PRINT P1$A;B$;C;D
570 CLOSE 1:CLOSE 15
READY.
```

Alpha Sort

Remember thinking "if only I had a list of all my programs and wouldn't it be nice it they were in alphabetical order." Then ponder no longer. That's just what this program does.

Simply type in Alpha Sort exactly as it appears in the listing. All cursor controls have been changed into character strings to make life a little easier for those of you still juggling with the control, CBM and shift Keys. The machine code data has been written in such a way as to aid you finding any of those nasty bugs which so often creep into our programs. This has been achieved by dividing the data into blocks of five lines, each block having its own checksum. The block and the checksums are then displayed should an error occur.

Once you have the program up on its feet and running you will be presented with 'INSERT DISK THEN HIT RETURN' this gives you a chance to take out your Alpha-Sort program disk or whatever and put in the disk you want listed. The directory of that disk will then be loaded into your computer after which '??? ENTRIES LEFT: ANOTHER DISK?' will be displayed. You can keep inserting disks until there are only a few entries left, the 'NO MORE ROOM' message appears or you run out of disks to be sorted.

Now for the big moment. You've stuffed umpteen disks into your disk drive and have decided to call it a day. So how do you get something for all your effort? Simply type 'N' in reply to the prompt 'ANOTHER DISK' and then depending on how many entrys you have put in, (it has just sorted the data. WOW!) the computer will respond with 'OUTPUT TO SCREEN OR PRINTER (S/P)'. You will then be presented with a list of all your precious programs. If the output is to printer it will be in the format: Program name, File type, Blocks free, Diskette name, and the ID.

The Output to the screen is the same except that the diskette name has been omitted to enable it to fit on the screen.

As Alpha-Sort stands it loads in several diskette directories and then outputs them as one list in alphabetical order.

The following lines when added will enable you to select which directory entries you want on your final list. This is done by displaying (Y/N) after each entry it loads. A 'Y' or 'N' response will accept or reject that entry. For example you may wish to have a separate games or utilities list or even a separate sequential files list.

First change line 200 to:

200 if FR< >0 then GOTO 2000

Then add the following lines:

2000 PRINTD$IN$TAB(18)"(Y/N)
"CHR$(18);
2010 GETR$:IFR$=" "THEN2010
2020 PRINT r$
2030 IFR$< >"Y"THEN 220
2040 I$(Z)=LEFT$(INP,18)+C$+
RIGHT$(P$+STR$(C),7)+
" "+XD$:GOTO210

Both PLUS EIGHT and ALPHA-SORT are very much skeleton programs deliberately missing out all the frills and extra facilities that could have been added. I have done them this way to reduce the amount of typing and thereby reduce the chances of miss-entering then into your computer. I look forward to seeing other people's versions of these programs complete with all the extra embelishments and facilities possible. (I wouldn't mind a copy).

```
EXAMPLE OF ALPHA-SORT AT WORK

 AID                PRG      30    DEVELOPMENT      64 2A
 BOOT               PRG       1    DEVELOPMENT      64 2A
 C1A2T3             SEQ      10    UTILITY          00 2A
 CAT5               PRG       2    EXPERIMENTAL     64 2A
 DISK FIX           PRG       3    MASTER           MA 2A
 DISK FIX2          PRG       4    MASTER           MA 2A
 DS.C               PRG      43    MASTER           MA 2A
 DS1                PRG       2    MASTER           MA 2A
 EDITOR             PRG       7    EXPERIMENTAL     64 2A
 MON                PRG      17    DEVELOPMENT      64 2A
 NDS                PRG       2    MASTER           MA 2A
 PLUS EIGHT+        PRG       7    DEVELOPMENT      64 2A
 POKE 22            PRG       4    DEVELOPMENT      64 2A
 READ ASCII         PRG       2    EXPERIMENTAL     64 2A
 SCAN BASIC         PRG       1    DEVELOPMENT      64 2A
 SHIFT FREEZE       PRG       2    EXPERIMENTAL     64 2A
 SORT.SYS           PRG       2    DEVELOPMENT      64 2A
 SOUND ROUTINE      PRG       2    DEVELOPMENT      64 2A
 T&S                PRG      10    IAN BENNETT      01 2A
 WEDGE              PRG      17    MASTER           MA 2A
 WRITE ASCII        PRG       1    EXPERIMENTAL     64 2A
```

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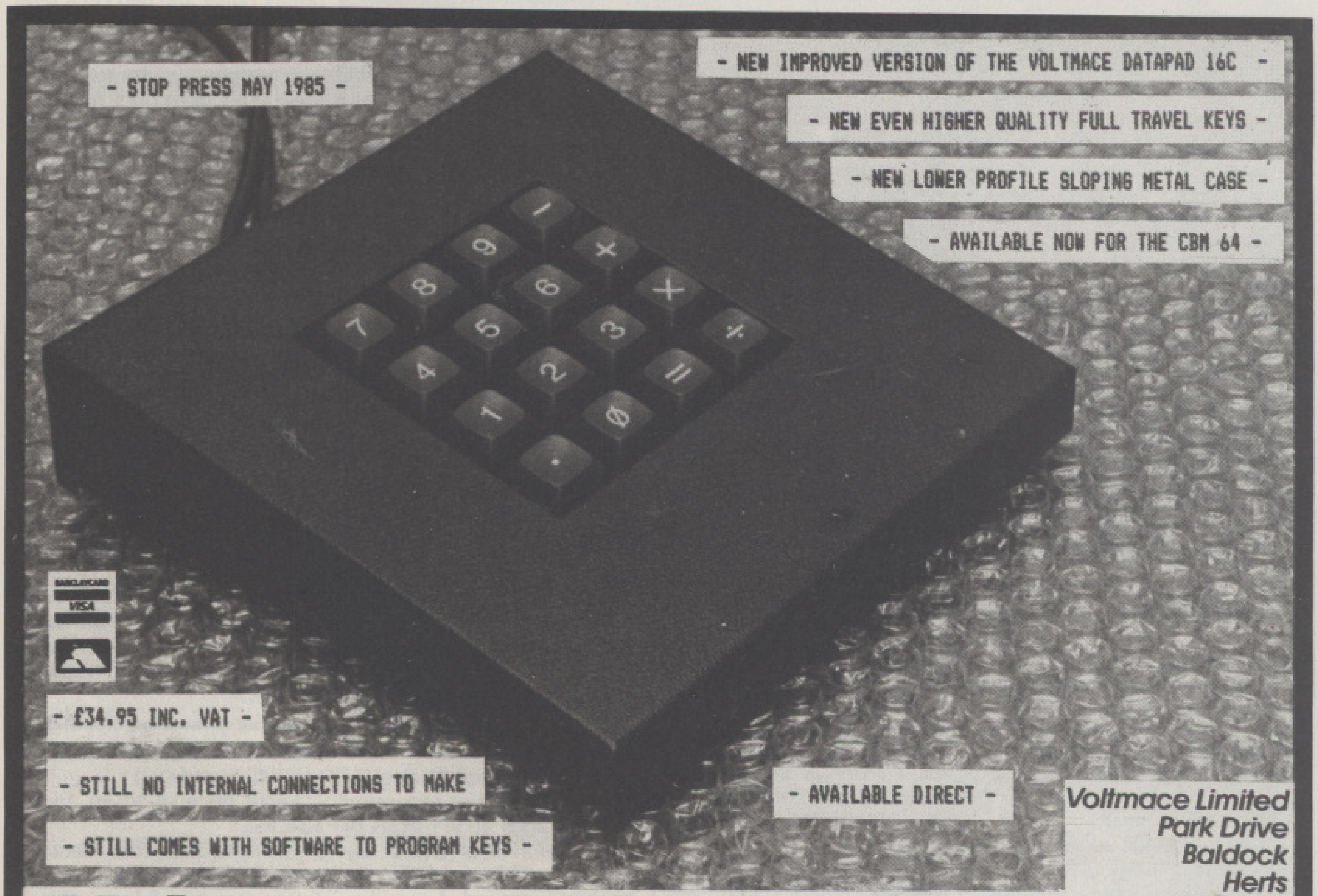

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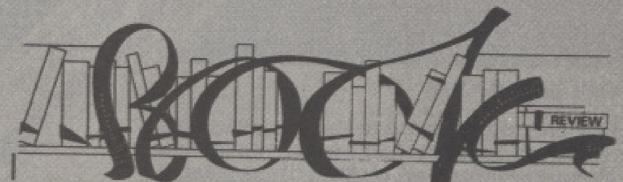

COMMODORE 16 USER'S MANUAL by Steve Finkel and others — £11.95

This book describes itself as an intermediate level programming guide and, for once, the blurb is accurate. It's a book between the manual that arrives with the computer and the more advanced Programmer's Reference Guide. It's a book for novices rather than absolute beginners because it assumes that you will have read the documentation that came with the computer, that you will have set up the computer correctly and that you've: 'gotten' used to the keyboard. (Yech! How I hate that word 'gotten').

It's undoubtedly a worthwhile buy for those it's aimed at. It's clearly laid out and deals with subjects in a logical order. It sets the reader programming straight away and gets on to sound and graphics pretty quickly which should please anyone who's had to wade through pages and pages of warnings, advice and introductory technical information before they come across anything exciting to do. The Basic 3.5 used in the C16 and Plus/4 is better than the previous versions of Basic used by Commodore and they have taken note of the complaints about the 'inaccessibility' of the sound and graphics on the Commodore 64. This means that it's much easier to get the sound and graphics quickly.

The first and biggest of the three parts of the Manual is a general section with six chapters on subjects such as Numbers and Calculations, Beginning Basic Programming and Sound and Music. The second section is a Basic 3.5 Encyclopedia which deals with each of the commands and functions in alphabetical order. The third and final section consists, of course, of appendices — ten of them altogether.

The fact that no attempt has been made to adapt The Commodore 16 Users's Manual for the British market is a major fault. The use of words like that awful 'gotten' and the general chatty style of the writing are irritations, but to be recommended to American magazines and American books is more than irritating. I wouldn't expect anyone to rewrite the whole book because it adopts an American style of writing which I personally find irritating (and which many British writers are copying) but I would believe that the publishers had more respect for the British readers if they added factual information relevant to the British market.

Contact: Pitman Publishing, Southport PR9 9YF. Tel: 01-379 7383.

EASY PROGRAMMING: COMMODORE 16 by Ian Stewart and Robin Jones — £5.95

This is another 'Good Book' for Commodore 16 owners who are not only new to the Commodore 16 but who are completely new to computing. This time you're taken from the very beginning from setting the machine up to using data files. It starts at a lower level and takes the reader to a more advanced stage than the Commodore 16 User Manual also reviewed in this issue. I find the style just a little more acceptable than the American style in the User Manual although it does have some of the same elements.

Because Easy Programming is wider in scope it tends to include rather a lot which is applicable to all micros and not just the C16. The ground covered in the User Manual relates directly to the C16. To choose between the two would be difficult — the best idea would be to buy both!

Easy Programming is part of the Shiva Friendly Micro Series which is generally of a good standard. In a series such as this you're bound to be covering the same ground in different books. What, for instance, would be the point of rewriting the parts of a book which could refer to two different computers? Say you'd written a book called Easy Programming for the Commodore 64 — wouldn't it be easy just to go through it and make changes where changes are necessary and call it Easy Programming: Commodore 16?

This is just what's been done, but don't be put off. It doesn't detract from the book at all.

Contact: Shiva Publishing, 64 Welsh Street, Nantwich, Cheshire CH5 5ES. Tel: 0270 62940.

Peter Arnott-Job

Variety of printers

Software company Tymac UK is entering the hardware market with an "intelligent" interface for Commodore home computers, including the C16 and Plus/4.

The interface is considered intelligent because it detects automatically what type of printer is being used and converts Commodore ASCII code into standard ASCII code accepted by most printers. Called The Connection, it is a parallel interface which plugs into the serial (disk) socket at the back of the computer.

Among the printers Tymac says the interface accepts are Epson, Gemini, 10X, Prowriter, Okidata and NEC.

Tymac says the interface "passes the Commodore printer test — virtually any software that expects a Commodore printer will run with this interface as will most other popular parallel printers."

The Connection has a 2K printer buffer and two LEDs tell you the status, eg ready or busy. A built in reset button allows the user to interrupt printer functions. The interface's microprocessor is 6502, the same as the computer, and substitutes a code for Commodore's special graphics characters thus reproducing them as if the printer were a Commodore.

The Connection supports all of the standard commands, column tabbing, dot tabbing, graphic repeat, etc. Built in the US, the interface works with virtually any parallel printer that uses a standard Centronics configuration and connection.

Retail price is £84.95 inc VAT for the Epson version, £79.95 inc VAT for all other models. The interface also works with the C64 and VIC 20.

Contact: Tymac UK Ltd, Unit 78, Standard Way, Gravelly Industrial Park, Tyburn Road, Birmingham B24 8TL. Tel: 021-327 6637.

Adventures converted

Melbourne House has converted two of its most popular adventure games for the C16 –

Wizard And The Princess and Classic Adventure.

Wizard originally was released for the Vic 20 and listed as top Vic 20 adventure by CCI in 1984. The graphic adventure is played in five levels with the traditional theme of player defeating wizard to rescue princess.

Classic Adventure is an update of Colossal Caves by Crowther and Woods. It features a series of puzzles that must be solved to complete the game. Both games retail at £5.95.

Contact: Melbourne House, Castle Yard House, Castle Yard, Richmond TW11 6TF. Tel: 01-940 6064

More basic

Hampshire-based Stonechip Electronics has released a RAM pack basic extension for the C16 similar to its original VIC 20 version.

Seductively named Vixen 16, it plugs into the rear expansion port and adds 16384 bytes of extra RAM in block one for use in basic. The capability for graphics is expanded considerably with a RAM pack since the C16's 12777 bytes free to Basic drops to 2045 bytes in high resolution mode.

Retail price of Vixen 16 is £34.95.

Contact: Stonechip Electronics, Unit 9, Brook Trading Estate, Deadbrook Lane, Aldershot, Hants GU12 4XB. Tel: 0252-333362

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ORDER AS DCL4
Price £18.00 (CBM 64 & VIC 20)

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Typing tutor from Superbase makers

Precision Software has put more than the usual beeps and blips in its new typing program, Supertype.

The computer tutor gives feedback such as number of words and the time it took, with how many errors. But Supertype also monitors the performance as the user types and indicates in the result screen where additional work is needed — which keys and which fingers. The pupil can then try the same lesson again or go on to another.

Supertype is claimed to be as suitable for the experienced typist who wants to learn touch typing as for beginners. Among the main features are the use of colour to match fingers to keys on the keyboard and stress on rhythm as well as speed.

The program comes with a stand-up manual and coloured stickers for the keyboard. The lot retails for £19.95 for the 64 cassette version. Precision expects to have a business version available soon for IBM PC compatibles.

Contact: Precision Software Ltd, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ. Tel: 01-330 7166.

Serial interface

The latest 'Connexions' product is a self-contained cable interface for the 64 designed to replace Commodore's own 1011A interface.

The RS232 serial interfact cable connects the 64 to most serial peripherals for a price of £19.95. SMC Supplies says it is available from Boots and most computer stores.

Contact: SMC Supplies, 11 Western Parade, Great North Road, Barnet, Herts EN5 1AD. Tel: 01-441 1282.

Epson produces compact portable

"On-the-spot reports, instant quotations, memory jogging notes and program listings" are the uses Epson has in mind for its new portable printer, the P-40.

Charged by internal rechargeable batteries, the P-40 comes with parallel or serial connections to make it compatible with many machines, including the 64. It prints dot matrix with a speed of 45 characters per second and type styles may be changed with software in the form of basic programs. Available are four character sets and a graphics bit image mode.

The starter pack retails at £86.91 ex VAT and includes a mains adaptor, operations and configurations guide and sample programs-interconnection guide. VSI Electronics who is handling the P-40 says it would work on the 64 with the Easyscript word processor and a standard parallel interface. It does not yet work with basic (thus listings would be eliminated from the uses), but VSI is working on it.

Contact: VSI Electronics Ltd, Roydonbury Industrial Park, Horsecroft Road, Harlow, Essex CM19 5BY. Tel: 0279-35477.

Communications price war on

Competition is already hitting the fast-moving computer communications field. Tandata is trying to lure clients its way with a free quarterly subscription to Prestel and Micronet with each modem-micropack combination bought by 31 July.

The subscription comes in the form of two vouchers. It is also available for those who buy complete viewdata terminals with the appropriate software. Tandata modems range in price from £99 to £173 ex VAT.

Tandata also recently launched a new "advanced, professional" modem called the Tm512 and designed for use with a micro, a dedicated terminal or separately with its own microprocessor and operating system. For the £295 ex VAT you pay, you get a modem that transmits and receives at 1200, 2400, 4800 or 9600 baud, automatically sensing which rate, parity and dial tone to use. You also have access to an adjustable directory of phone numbers for automatic dialling, a directory of passwords and IDs. The usual file transfer, database access and user-to-user communication are available when used with a computer.

Contact: Tandata Marketing Ltd, Albert Road North, Malvern, Worcs WR14 2TL.

Software added to robot pack

A robot that can be interfaced to the 64 now comes with £200 worth of software to run it.

The model 310 is from Cyber Robotics, recently taken over by J Bibby Science Products Ltd with an injection of new capital and a change of management. As described before in CCI, the 310 has five degrees of movement plus gripper action and can rotate its shoulder 300 degrees to allow it to work, in effect, with the arm upside down.

The software that now is included in the hefty £650 price is an applications package that lets you just describe a position in space and the gripper's approach angle. Usually, you would have to specify which joint to move and by how much.

Other programs in the package include direct keyboard control and Towers of Hanoi.

Contact: Cyber Robotics Ltd, Stone, Staffs ST15 0SA. Tel: 0785-812121.

Two printers on special offer

Dean Electronics is running a limited time offer on its Alphacom 42 and Alphacom 81 printers, cutting both well below the £100 mark.

The 42, a 40-column printer, has been reduced from £99.95 to £49.95 including VAT and the appropriate interface, while the 80-column Alphacom 81 is now £74.95, down from £149.95.

Both printers can be interfaced to the 64 or VIC 20. The special offer runs through 31 July of this year. Postal orders should include £2 for postage and packing.

Contact: Dean Electronics Ltd, Glendale Park, Fernbank Road, Ascot SL5 8JB. Tel: 0344-885661.

Doubling up on floppies

Associated Computer Marketing has launched a new device to cut a notch in floppy disks to double their capacity. ACM says it can be used on drives for at least five types of computers including Commodore. Commodore doesn't recommend it . . . but ACM say they've tried it and had no problem.

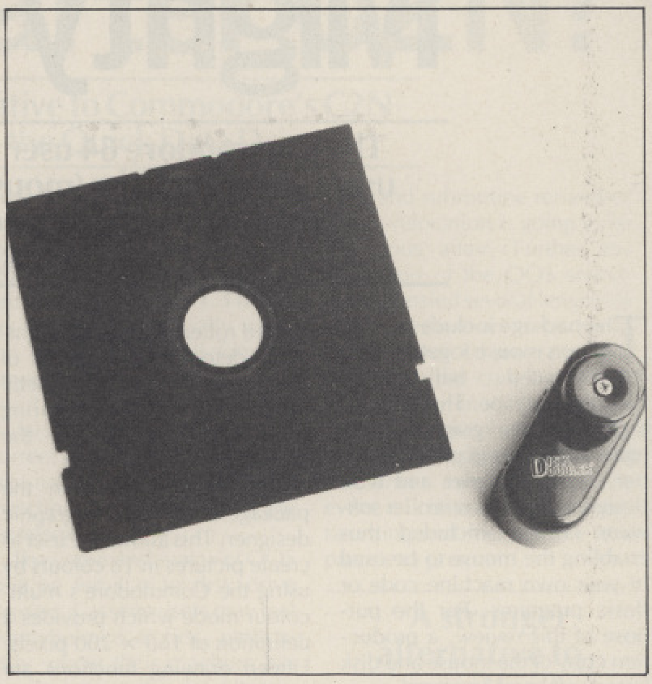
What to do. Well, here is the story. You decided for yourself.

Called Disk Doubler, the product has a built in positioning guide and cuts a notch in the proper place on the disk as opposed to cutting it with a pair of scissors in which case you could get carried away and slice the disk in two. Considering the average £1.20 you pay for single sided disks, this seems a terrific saving for frequent disk users.

But Chris West of Commodore's Software Products department says the risk may not justify the savings. He says trying to use both sides of a disk in a single sided disk drive means a disk turning one way for the primary side would turn the other way when inserted upside down, thus lossening dust particles that may be trapped in corners. The dust, in turn, could corrupt the disk or ruin the whole drive.

"For the price of buying another disk, it just isn't worth it," West said.

However, John Goodman of ACM says he has personally tried the method on his 1541 disk drive with no problems whatsoever. Regarding the dust, Goodman said most floppies come with lint-free jackets anyway, hopefully reducing that danger. Furthermore, more than 50,000 Disk Doublers are "sold each month," the majority of them in the US — a usually picky market when it come to computers.



So judge for yourself. Commodore does not actually say the method does not work, only that it is "not recommended." In any case, the Disk Doubler costs £15 incl VAT and delivery.

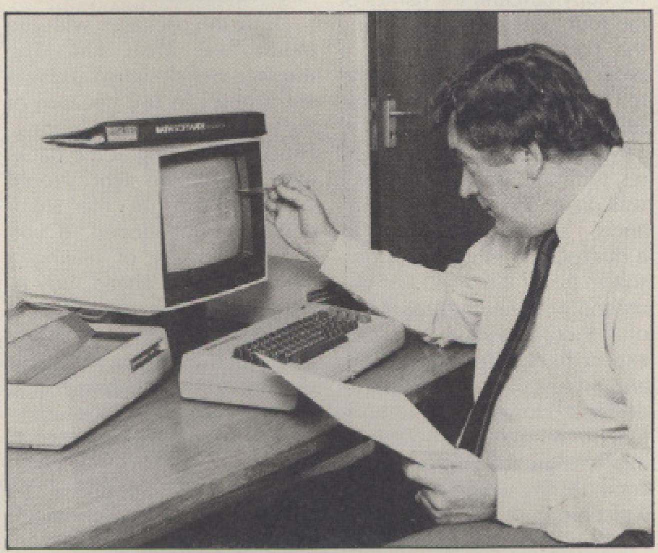
Contact: Associated Computer Marketing Ltd, 54 Grosvenor Road, Aldershot, Hampshire GU11 3DY. Tel: 0252-333000.

C64 crawls into the woodwork

This isn't a particularly new product, but if you've heard of Magi-Cut before us you're one step — or slice ahead.

The software package was originally written for the 64 by Jaydee Machine Sales Ltd and aimed at the very specialised industrial panel cutting industry.

When loaded, the user inserts a schedule of all panel sizes to be cut and the raw board (glass, steel, wood or plastics) size to be used. The computer then displays the optimum cutting pattern on the screen and on a hard-copy printout if needed. Jaydee also handles two other programs for the woodworking industry for Commodore computers.



The news peg is that Magi-Cut is now available for the IBM-PC which means it also works, presumably, on the Commodore PC. This version also calculates raw materials and labour costs, giving a total picture of the cost of panel sizing.

Now aren't you thrilled? Well, there's nothing wrong with it. It's just that it makes one want to make jokes about chips off the old block, calling up and axing for . . .

Contact: Jaydee (Machine Sales) Ltd, Copyground Lane, High Wycombe, Bucks HP12 3HE. Tel: 0494-34091/2

Complex accounts

A London-based commercial software company has released its high-level SunSystems accounting package for the micro-computer market.

The price is high, however, £1,475 for the SunBusiness MS-DOS version required to run on the Commodore PC. Separately, SunAccount retails for £1,475, SunInventory for £575 and SunInvoice for £575.

Contact: Systems Union Ltd, 34 Delancey Street, Camden Town, London NW1 7NH. Tel: 01-485 2594.

Leonardo

We would like to apologise if we got your hopes up about a great new graphics package from Creative Sparks called Leonardo. It is not, was not and never will be available for Commodore computers!

Our story in the May 1985 issue implied that it would be, but WRONG. It was created on the Spectrum for the Spectrum and nothing else. Sorry!

Mighty Mouse?

The Commodore 64 user need not envy BBC micro users any more! The 'mouse' trend has arrived in the shape of Magic Mouse from SMC Supplies. David Janda looks inside.

The package includes a three button mouse together with rubber-coated ball-bearing, cassette and tape. The software includes three graphic packages: a high-res graphics designer, Sprite designer and Icon designer. Mouse controller software is also included thus enabling the mouse to be used in your own machine code or Basic programs. For the purpose of this review, a production copy of the mouse and disk based software were used.

Features

Compared to other mice, the SMC mouse is pretty large and heavy — something which I preferred. The mouse is controlled by three coloured, click-type buttons housed on the front of the mouse. The cable leading from the mouse is of a decent length and this connects to the 64 via control port two — one of the joystick ports.

Looking at the underside of the mouse revealed that movement is detected with a rubber-coated metal ball-bearing. The ball-bearing is held in place by a small Phillips screw. Within the mouse itself, two rubber-coated rollers placed at a right-angle detect the movement of the bearing and a third metal roller ensures that the bearing does not 'rattle' within the mouse.

The main program in the package is the high-res graphic designer. This allows the user to create pictures in 16 colours by using the Commodore's multi-colour mode which provides a definition of 160 × 200 pixels. Fifteen drawing functions are provided, as well as the ability to save/load your creations to disk or tape. Table one lists the functions available in the high-res package.

A Commodore compatible serial or Centronics type printer may be used for small screen dumps. Centronics printer-driver software is included within the high-res package, but it should be noted that it will be necessary to connect the printer to the 64 via the user port.

The Sprite designer is used to create sprites in normal or multi-colour mode. Features include sprite selection, colour change, sprite expansion (in X and Y directions), reverse pixel status and so on. The Icon designer offers similar facilities, and allows 3 × 2 blocks of characters to be defined which can be saved as a block or as individual UDG's.

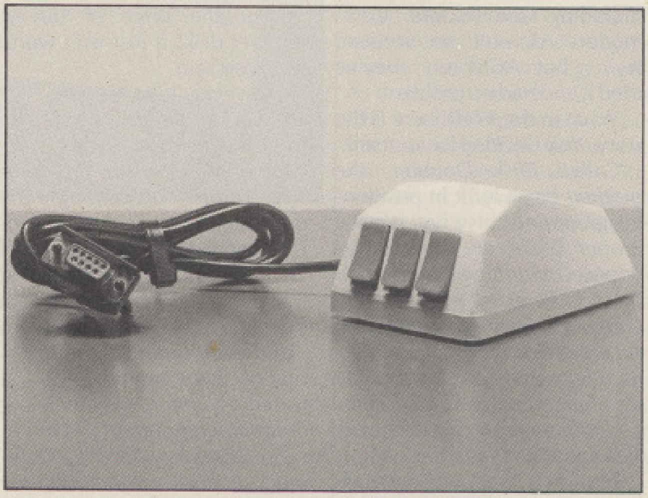


Table 1 — High-res functions

DRAW	Allows free-style drawing
LINE	Draws line between two points
LINES	Similar to line except subsequent lines are connected to the end of last line
FILL	Fills closed area with selected colour
TEXT	Allows text (small and large) to be incorporated within design
FRAME	Draws frame between two points and then fills with colour
BOX	Same as FRAME except will be filled with drawing colour
CIRCLE	Draws circles!
RAYS	Draws lines to a specified point
AERO	Draws a spray pattern
CLEAR	Clears drawing area
RUBBER	Delete selected parts of screen
HORIZONTAL	Disables vertical movement
VERTICAL	Disables horizontal movement
FINE	Allows user to draw in fine detail by using keyboard control of pointer
LOAD/SAVE	Load/Save designs

In use

Setting-up was easy enough. First, the ball-bearing had to be inserted into the mouse. The next task was to align the mouse pointer and this involved adjusting two small trim screws on the underside.

Once the disk software is loaded, a main menu displays the copyright and the names of the four packages. Positioning the pointer (a hand) over a program name and pressing the red button loads and runs the selected application.

My first choice was the high-res program, and in general I was pleased with the performance. The designer operates in a dual-screen mode, with one screen being the menu and the second, the drawing area. Most of the commands you would expect in a graphics package are included in the high-res designer. However, a few more functions such as rubber-banding, arc drawing or even a zoom facility would have been welcome.

Moving onto the Sprite designer and the Icon designer, I was a bit disappointed. The screens are nicely presented and each package had an ample number of commands, yet using the packages was not that easy. In both cases, the commands are selected by moving the pointer to the bottom-right of the screen where a calculator-type menu pulls down — to reveal letters and numbers! If only a separate pull-down menu could have been dedicated for each command explaining its function the commands would have been easier to use.

Conclusion

Using the packages with the mouse was great fun. The mouse is well designed and was not slippery in use because of the rubber-coated ball-bearing. However, looking at the packages in their own right I would criticise them on the small points I've mentioned. If you like the novelty of having a mouse, then go ahead, buy it, but if you're more serious on the graphics side there are packages, such as Koala Pad, that give more for less money and are driven by a simple joystick. The price of Magic Mouse is £59.95.

Contact: SMC Supplies, 11 Western Parade, Great North Road, Barnet, Herts. Tel: 01-441 1282.

Is there life after C2N?

Bill Donald looks at one alternative to Commodore's C2N cassette storage device — the Quick Data Drive

At the present time (May 1985), there are four possible methods of program storage available to all Commodore microcomputer users. They can be conveniently divided into two areas; tape and disk.

Tape has a cost advantage for both the manufacturer and end user as well as better physical protection for the stored data over floppy disks. Disks have the overwhelming advantage of being able to access the stored data by means of reading anywhere on the disk surface: a simple analogy being the familiar music cassette and LP record. To select an individual music track on a cassette requires the user to run through under manual or machine control the other unwanted tracks (which is usually an age away from where you started!), whereas the LP tracks are visible at all times to the pick-up arm and consequent selection of the desired music is much quicker.

The tape and disk division can be further subdivided in terms of the disk devices which consist of floppy disk drives and hard disk drives, the latter representing the most expensive in hardware aquisition costs. Similarly the tape devices can be subdivided into cassette and streamer (or wafer drives). The difference between these is that the latter has the tape on a finite loop, the length of which ultimately determines the storage capacity.

The real measure of a storage device's efficiency is the data delivery time in bits/second and the cost/byte stored. In this context I will ignore the former since for most domestic users it is not relevant. I have compiled the following table which is quite revealing:—

Storage Costs

Device	Cost (£)	Capacity (KB)	Cost/KByte (£)
Spurious Cassette Units	25.00	54 *	0.46
CBM C2N Cassette	45.00	54 *	0.83
QUICK DATA DRIVE (wafer)	100.00	128	1.28
CBM 1541 Disk Drive	200.00	170	0.85
CBM 8250 Disk Drive	1029.00	2000	0.51 **
CBM 9090 Hard Disk	2500.00?	1000	0.25 **

* Assumes 300 baud and 30 minute cassette.

** Requires IEEE 488 interface at additional cost (minimum £60.00) for VIC, C16, 64 and PLUS/4 users.

The QUICK DATA DRIVE is a tape streamer device for the Commodore 64 and comes with three wafers and operating manual. It plugs into the cassette port and there is provision on the rear of the unit for daisychaining additional drives or maintaining the use of the ubiquitous cassette unit.

The beige plastic case is about the size of the Commodore modem so positioning the drive, which has a good length of cable should present no problems. A peek inside reveals a well designed pcb with a BSR cassette head assembly. The ics are all 74LS series, which, whilst not being the best technically, certainly are amongst the cheapest and I would estimate that the production costs must be less than £20.00 for the whole thing.

"Size presents no storage problems"

The three wafers mentioned earlier consist of a blank, a game and an operating system master called QOS (Quick Operating System). The documentation consists of a 38-page user manual and game leaflet. The manual has been written to a high standard of comprehension and certainly the author is to be congratulated. There is no index, although the table of contents provided an easy entry into the manual. A full explanation of each command, connecting up, memory map and a section on questions and answers is given. He (or she) must have had their work cut out to get this lot into 38 pages. Stand up and take a bow, whoever you are!!

To initialise the drive a wafer is inserted and in direct mode a command is given to LOAD from the cassette unit (device no. 1). The drive then boots up the operating system and in effect acts as a shadow cassette using device number 1. I found no problems in actually using the drive; it was all familiar ground to a hard-bitten driver of two 1541's such as myself. The wafers can only be inserted the correct way up, and since these are not much larger than a matchbox presented no storage problems.

The command syntax of QOS will be familiar to disk drive owners. Cassette users may feel overwhelmed at first, particularly where their machine has the cassette as the default storage device and half of the command work has been done for them already.

The operating system boots up by holding a program which emulates a C2N to the machine in use. This then autoloads and runs the main QOS program. A utility program called FMU, short for File Management Utility is supplied as part of QOS and is user selectable. This is quite a powerful little number since it allows file transfer between disk, wafer and tape in any combination involving the wafer. FMU is required when using a new wafer since formatting is necessary. FMU also allows the use of a wafer directory. QOS and FMU supports either sequential or program files, although in theory, relative files should be possible if the system can support sequential files.

However, below the surface, matters looked somewhat different. The QOS source code resides at $49152, probably the most overworked section of RAM in any Commodore 64. FMU resides in the RAM beneath the BASIC ROM at $A000 and is accessed on interrupt, so why choose $49152 for QOS? A better choice would have been under the KERNAL ROM at $E00, again using interrupts.

Unfortunately QOS is not easily relocatable since it contains a jump table near the start of the code, so unless your assembler contains a jump table and subroutine renumber mode, relocation is going to be a tedious affair. Further examination of the QOS source code revealed several lenghts of NOP's. If these are to be found in a commercial program I can only draw the conclusion that the programmer has either failed to write correct timing loop delays or is wasteful of MY machines memory. In any event it is unprofessional programming and inexcusable in a proprietry program.

"A stronger alternative to cassettes"

Source code aside, QOS and FMU worked very well, although the game wafer refused to allow the 64 to go beyond the demonstration stage, proving the fault lay in the wafer and not the drive. I think that you either love or hate these things (ask any Spectrum Microdrive owner). Personally my feeling is that anything has to be better than the C2N, but then again I am used to disk drives.

I would recommend the Quick Wafer Drive as a stronger alternative to cassettes, however, I would also add one rider to this.

Looking at the table of storage costs, the drive is overpriced at £99.99 including VAT. I feel that the importer is pitching his price at the Microdrive level and although this marketing philosophy is fine for Spectrum users who at the moment do not have a viable alternative random access device such as a disk drive, the Commodore market has stiffer competition, so the present recommended retail price is unrealistic. I certainly intend buying one, but not at the current price.

Contact: Dean Electronics Ltd, Glendale Park, Fernbank Road, Ascot, Berkshire SL5 8JB. Tel: 0344 885661.

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CBM gets life

David Hornsby has sent us this fast machine code program to simulate "Life", the game devised by British mathematician, John Conway. It will run on all PET/CBM 40 or 80 column computer. Sufficient information is given to allow the program to be adapted to run on other 6502 based computers.

The program comprises a simple BASIC driver and machine code in data statements which are poked into RAM. Choose the data statements (line 570 onwards) according to the screen size you have. The assembly listing of the machine code part of the program is only included for the information of those wishing to adapt the program for use on another 6502 based computer.

The program first pokes the machine code into RAM memory and then asks you to enter a pattern of stars: try a line of half a dozen or so to start with. Next you will be asked for the number of generations to be processed. Keep this number small while you are getting the feel of the program. The 40 column PET will process more than six generations a second, the 80 column half this number because its screen is twice as big. The processing is done by machine code since in BASIC it takes three to six minutes per generation, about 1000 times slower!

The rules

The rules for "Life" are simple. Life cells, represented here by stars, are arranged in any number and in any position on a matrix of squares, the screen of the computer in this case. A second generation of stars is then computed according to the following rules:

Each cell is surounded by eight adjacent squares, each of which may contain another cell called a neighbour.

1) a cell with less than two neighbours dies

2) a cell with 2 or 3 neighbours survives

3) a cell with over 3 neighbours dies (overcrowding)

4) a space with 3 neighbouring cells has a new cell born into it.

The aim of the game

The aim of the "game" (investigation) is to start with a small pattern of cells and arrange them in such a way that they produce a larger colony of cells in the next generation. This should continue to grow in subsequent generations. Some colony patterns quickly die out. Others may remain static. Some grow, then die back only to start growing again. Some move across the screen. "Life" was originally played using ony pencil and paper to map out the next generation, but the computer does the job faster and more accurately.

The "Life" program here uses all 1000 (2000 for 80 column machines) locations of the screen for its universe. It is continuous top to bottom and left to right. A hard copy of the pattern may be requested by respondng "Y" to the appropriate question when the number of generations requested has been processed. Actually it is the previous generation which is printed. If this annoys you, simply change line 500 from

```
500 OPEN4,4:PRINT#4:VDU=5
```

to

```
500 OPEN4,4:PRINT#4:VDU=32768
```

but then the top lines of the screen are lost to the printer because of the messages written there. Any part of the BASIC program may be amended in similar fashion without upsetting the machine code, provided the data statements and the values V1 to V7 and the POKE statements are left in place.

Single stepping, generation by generation, is possible with this program. Simply press the RETURN key to enter the default values provided when the program halts. If you wish to re-run the program from start, enter GOTO 290 to save the time for the machine code to be poked in again.

SOME PATTERNS TO GET YOU STARTED

```
                 *
   **           * *
   **           * *
               ** **

A "Block"      A "Hat"
-------STABLE---------


           ****
 ***      *   *        ***
   *          *        * *
  *       *  *         * *

  "Space Ships"    The "Acorn"
 ---MOVEMENT---    ---GROWTH--
```

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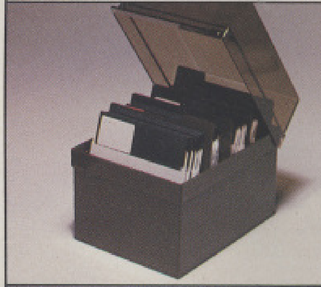

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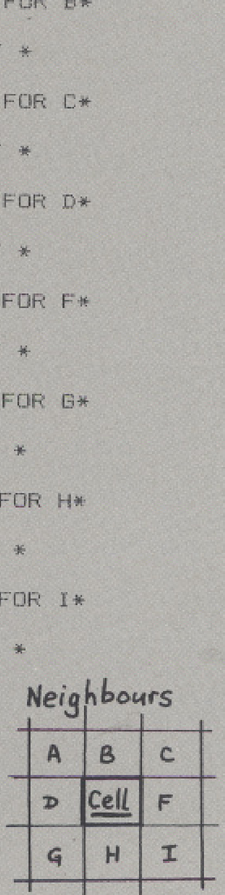
```
100 REM LIFE PROGRAM
110 REM ============
120 REM D.D.HORNSBY, MAY 1985
130 POKE53,23:POKE52,0:CLR:REM LOWER TOP OF RAM POINTER TO $1F00
140 READ V1,V2,V3,V4,V5,V6,V7
150 VT=V1+V2+V3+V4+V5+V6
160 IFVT<>V7THEN PRINT"DATA ERROR":STOP
170 PRINT"▩▩POKING MACHINE CODE INTO RAM"
180 X=0:C=0
190 X=X+1:READ A$:IFA$="**"THEN260
200 REM LINES 170-190 CONVERT HEX TO DECIMAL
210 A1%=ASC(LEFT$(A$,1)):A2%=ASC(RIGHT$(A$,1))
220 A1%=A1%-48+(A1%>57)*7:A2%=A2%-48+(A2%>57)*7
230 B=A1%*16+A2% :REM B IS DECIMAL OF DATA
240 C=C+B :REM C IS CHECKSUM
250 P=5887+X:PRINT"▩▩▩"P,B:POKE P,B:GOTO190
260 READ A:IF C<>A THEN PRINT"▩▩▩ERROR IN DATA LINES":STOP:REM CHECKSUM TEST
270 SP$="          ":REM 10 SPACES
280 FORX=1TOV1:SP$=SP$+SP$:NEXT X
290 PRINT"▩"TAB(13)"▩LIFE PROGRAM
300 PRINT"ENTER * PATTERN WITH CURSOR KEYS
310 PRINT"PRESS ▩RETURN▬ WHEN YOU HAVE FINISHED▩▩▩▩▩"SPC(15);
320 INPUT"▮▮*▮▮▮▮▮▮";A$
330 POKE V2,96:SYS V3
340 PRINT"▩INITIAL GENERATION RECORDED
350 INPUT"▩▩▩HOW MANY GENERATIONS (1 - 65535)";G:G=INT(G+.5)
360 IFG>65535 OR  G<1 THEN PRINT"▩▩"G"▬IS OUTSIDE THE RANGE ▩1-65535":GOTO0350
370 G1=INT(G/256)
380 G2=G-(256*G1)
390 POKE V2,234:POKE254,G2:POKE255,G1:SYS V2+1
400 PRINT"▩"SP$
410 PRINT"▩LAST GENERATION IS STILL STORED"
420 INPUT"▩▩▩DO YOU WANT A PRINTOUT(Y/N)▬▮▮N▮▮▮▮▮▮";A$
430 IF LEFT$(A$,1)="Y" THEN GOSUB500
440 PRINT"▩LAST GENERATION IS STILL STORED"
450 INPUT"▩▩▩DO YOU WANT TO CONTINUE (Y/N)▬▮▮Y▮▮▮▮▮▮";A$
460 IF LEFT$(A$,1)="N" THEN STOP
470 INPUT"▩▩▩HOW MANY GENERATIONS (1 - 65534)▮▮1▮▮▮▮▮▮";G:G=INT(G+1.5)
480 IFG>65535 OR G<2 THENPRINT"▩▩"G-1"▬IS OUTSIDE THE RANGE ▩1-65534":GOTO0470
490 SYS V4:GOTO0370
500 OPEN4,4:PRINT£4:VDU=V5
510 PRINT£4,CHR$(27)CHR$(49);:REM EPSON PRINTERS ONLY
520 FORX=1TO25:FORY=1TOV6
530 VDU=VDU+1:PRINT£4,CHR$(PEEK(VDU));
540 NEXTY:PRINT£4:NEXTX
550 PRINT£4,CHR$(27)CHR$(64);:REM EPSON PRINTERS ONLY
560 CLOSE4:RETURN
570 REM 40 COL DATA
580 ===============
590 DATA 3,5934,5888,6079,7150,40,25094
600 DATA A2,FA,BD,FF,7F,9D,EE,1B
610 DATA BD,F9,80,9D,E8,1C,BD,F3
620 DATA 81,9D,E2,1D,BD,ED,82,9D
630 DATA DC,1E,CA,D0,E5,A2,29,BD
640 DATA FF,7F,9D,D6,1F,BD,BF,83
650 DATA 9D,C6,1B,CA,D0,F1,60,A9
660 DATA 80,85,25,A9,00,85,24,A9
670 DATA 1B,85,27,A9,C6,85,26,A9
680 DATA 04,85,01,A9,FA,85,02,A0
690 DATA 00,A2,00,A9,2A,D1,26,D0
700 DATA 01,E8,C8,D1,26,D0,01,E8
710 DATA C8,D1,26,D0,01,E8,A0,28
720 DATA D1,26,D0,01,E8,A0,2A,D1
730 DATA 26,D0,01,E8,A0,50,D1,26
740 DATA D0,01,E8,C8,D1,26,D0,01
```

```
750 DATA E8,C8,D1,26,D0,01,E8,E0
760 DATA 02,F0,0E,E0,03,F0,04,A9
770 DATA 20,D0,02,A9,2A,A0,00,91
780 DATA 24,E6,26,D0,02,E6,27,E6
790 DATA 24,D0,02,E6,25,C6,02,D0
800 DATA A6,C6,01,D0,9E,C6,FE,D0
810 DATA 09,A9,00,C5,FF,D0,01,60
820 DATA C6,FF,20,E1,FF,D0,05,A9
830 DATA 60,8D,2E,17,4C,00,17,A2
840 DATA FA,BD,EE,1B,9D,FF,7F,BD
850 DATA E8,1C,9D,F9,80,BD,E2,1D
860 DATA 9D,F3,81,BD,DC,1E,9D,ED
870 DATA 82,CA,D0,E5,60
880 DATA **,30779
```

```
570 REM DATA FOR 80 COLUMN
580 REM ===================
590 DATA 4,5958,5888,6099,7150,80,25179
600 DATA A2,FA,BD,FF,7F,9D,EE,1B,BD,F9,80,9D,E8,1C,BD,F3
610 DATA 81,9D,E2,1D,BD,ED,82,9D,DC,1E,BD,E7,83,9D,D6,1F
620 DATA BD,E1,84,9D,D0,20,BD,DB,85,9D,CA,21,BD,D5,86,9D
630 DATA C4,22,CA,D0,CD,A2,51,BD,FF,7F,9D,BE,23,BD,7F,87
640 DATA 9D,9E,1B,CA,D0,F1,60,A9,80,85,25,A9,00,85,24,A9
650 DATA 1B,85,27,A9,9E,85,26,A9,08,85,01,A9,FA,85,02,A0
660 DATA 00,A2,00,A9,2A,D1,26,D0,01,E8,C8,D1,26,D0,01,E8
670 DATA C8,D1,26,D0,01,E8,A0,50,D1,26,D0,01,E8,A0,52,D1
680 DATA 26,D0,01,E8,A0,A0,D1,26,D0,01,E8,C8,D1,26,D0,01
690 DATA E8,C8,D1,26,D0,01,E8,E0,02,F0,0E,E0,03,F0,04,A9
700 DATA 20,D0,02,A9,2A,A0,00,91,24,E6,26,D0,02,E6,27,E6
710 DATA 24,D0,02,E6,25,C6,02,D0,A6,C6,01,D0,9E,C6,FE,D0
720 DATA 09,A9,00,C5,FF,D0,01,60,C6,FF,20,E1,FF,D0,01,60
730 DATA 4C,00,17,A2,FA,BD,EE,1B,9D,FF,7F,BD,E8,1C,9D,F9
740 DATA 80,BD,E2,1D,9D,F3,81,BD,DC,1E,9D,ED,82,BD,D6,1F
750 DATA 9D,E7,83,BD,D0,20,9D,E1,84,BD,CA,21,9D,DB,85,BD
760 DATA C4,22,9D,D5,86,CA,D0,CD,60
770 DATA **,37896
```

```
100  033A                ; SOURCE CODE OF LIFE PROGRAM FOR 40 COLUMN PET
110  033A                ; =============================================
120  8000                SCREEN=$8000 ;THE START OF THE VDU RAM
130  1BEF                RAMST=8192-1041 ;RAM STORE FOR PROCESSING
140  0020                SPACE=$20 ;ASCII SPACE
150  0001                OUT4=1 ;ZERO PAGE COUNTER FOR OUTER LOOP
160  0002                IN250=2 ;ZERO PAGE COUNTER FOR INNER LOOP
170  0024                VDUPTR=36 ;ZERO PAGE POINTER TO THE VDU
180  0026                RAMPTR=38 ;ZERO PAGE POINTER TO THE RAM STORE
190  00FE                GENCTR=254 ;COUNTER OF THE NUMBER OF GENERATIONS
200  FFE1                STOP=$FFE1 ;SAME  FOR ALL PET/CBM COMPUTERS
210  033A                ;
220  033A                *=$1700
230  1700                ;***********************
240  1700                ;* COPY SCREEN TO RAM *
250  1700                ;***********************
260  1700  A2FA          START        LDX  #250           LOOP 250 TIMES
270  1702  BDFF7F        MOVE1        LDA  SCREEN-1,X
280  1705  9DEE1B                     STA  RAMST-1,X
290  1708  BDF980                     LDA  SCREEN+249,X
300  170B  9DE81C                     STA  RAMST+249,X
310  170E  BDF381                     LDA  SCREEN+499,X
320  1711  9DE21D                     STA  RAMST+499,X
330  1714  BDED82                     LDA  SCREEN+749,X
340  1717  9DDC1E                     STA  RAMST+749,X
350  171A  CA                         DEX
360  171B  D0E5                       BNE  MOVE1          BRANCH IF < 250 LOOPS
370  171D                ;************************
380  171D                ;* FORM BORDER TO GIVE *
```

```
 390  171D                ;* WRAPROUND OF SCREEN *
 400  171D                ;************************
 410  171D  A229                     LDX  #41           LOOP 41 TIMES
 420  171F  BDFF7F        MOVE2      LDA  SCREEN-1,X
 430  1722  9DD61F                   STA  RAMST+999,X
 440  1725  BDBF83                   LDA  SCREEN+959,X
 450  1728  9DC61B                   STA  RAMST-41,X
 460  172B  CA                       DEX
 470  172C  D0F1                     BNE  MOVE2         BRANCH IF < 41 LOOPS
 480  172E  60            VAR        RTS                RETURN TO BASIC
 490  172F                ; VAR IS SET TO A NOP BY THE BASIC PROGRAM
 500  172F                ;**********************************
 510  172F                ;* ESTABLISH ZERO PAGE POINTERS *
 520  172F                ;**********************************
 530  172F  A980                     LDA  #$80          SET VDUPTR TO $8000
 540  1731  8525                     STA  VDUPTR+1
 550  1733  A900                     LDA  #0
 560  1735  8524                     STA  VDUPTR
 570  1737  A91B                     LDA  #>RAMST SET RAMPTR TO RAMSTORE-41
 580  1739  8527                     STA  RAMPTR+1
 590  173B  A9C6                     LDA  #<RAMST-41
 600  173D  8526                     STA  RAMPTR
 610  173F                ;****************************
 620  173F                ;* COMPUTE NEW GENERATION *
 630  173F                ;****************************
 640  173F  A904                     LDA  #4            LOOP 4 X 250 TIMES
 650  1741  8501                     STA  OUT4
 660  1743  A9FA          OUTER      LDA  #250
 670  1745  8502                     STA  IN250
 680  1747  A000          INNER      LDY  #0            MARKS * POSITION
 690  1749  A200                     LDX  #0            COUNTS NEIGHBOURS
 700  174B  A92A                     LDA  #$2A          LOOK FOR A*
 710  174D  D126                     CMP  (RAMPTR),Y
 720  174F  D001                     BNE  BSTAR
 730  1751  E8                       INX                COUNT *
 740  1752  C8            BSTAR      INY
 750  1753  D126                     CMP  (RAMPTR),Y    LOOK FOR B*
 760  1755  D001                     BNE  CSTAR
 770  1757  E8                       INX                COUNT *
 780  1758  C8            CSTAR      INY
 790  1759  D126                     CMP  (RAMPTR),Y    LOOK FOR C*
 800  175B  D001                     BNE  DSTAR
 810  175D  E8                       INX                COUNT *
 820  175E  A028          DSTAR      LDY  #40
 830  1760  D126                     CMP  (RAMPTR),Y    LOOK FOR D*
 840  1762  D001                     BNE  ESTAR
 850  1764  E8                       INX                COUNT *
 860  1765  A02A          ESTAR      LDY  #42
 870  1767  D126                     CMP  (RAMPTR),Y    LOOK FOR F*
 880  1769  D001                     BNE  FSTAR
 890  176B  E8                       INX                COUNT *
 900  176C  A050          FSTAR      LDY  #80
 910  176E  D126                     CMP  (RAMPTR),Y    LOOK FOR G*
 920  1770  D001                     BNE  GSTAR
 930  1772  E8                       INX                COUNT *
 940  1773  C8            GSTAR      INY
 950  1774  D126                     CMP  (RAMPTR),Y    LOOK FOR H*
 960  1776  D001                     BNE  HSTAR
 970  1778  E8                       INX                COUNT *
 980  1779  C8            HSTAR      INY
 990  177A  D126                     CMP  (RAMPTR),Y    LOOK FOR I*
1000  177C  D001                     BNE  ONO
1010  177E  E8                       INX                COUNT *
1020  177F                ;******************************
1030  177F                ;* TEST NUMBER OF NEIGHBOURS
1040  177F                ;* IF X=2 LEAVE ALONE
1050  177F                ;* IF X=3 WRITE NEW * (BIRTH)
1060  177F                ;* ELSE WRITE BLANK
1070  177F                ;******************************
```



Neighbours

A	B	C
D	Cell	F
G	H	I

```
1080  177F  E002      ON0 CPX  #2
1090  1781  F00E                     BEQ  SAME
1100  1783  E003                     CPX  #3
1110  1785  F004                     BEQ  BIRTH
1120  1787  A920                     LDA  #SPACE
1130  1789  D002                     BNE  NO               JUMP FORCED

1140  178B  A92A      BIRTH          LDA  #$2A
1150  178D  A000      NO             LDY  #0
1160  178F  9124                     STA  (VDUPTR),Y
1170  1791            ;*****************************
1180  1791            ;* UPDATE ZERO PAGE POINTERS *
1190  1791            ;*****************************
1200  1791  E626      SAME           INC  RAMPTR
1210  1793  D002                     BNE  ON1
1220  1795  E627                     INC  RAMPTR+1
1230  1797  E624      ON1 INC  VDUPTR
1240  1799  D002                     BNE  ON2
1250  179B  E625                     INC  VDUPTR+1
1260  179D            ;***************************************
1270  179D            ;* TEST TO SEE IF ALL SCREEN PROCESSED *
1280  179D            ;***************************************
1290  179D  C602      ON2 DEC  IN250           250 LOOPS DONE
1300  179F  D0A6                     BNE  INNER            NO
1310  17A1  C601                     DEC  OUT4             1000 LOOPS DONE
1320  17A3  D09E                     BNE  OUTER            NO
1330  17A5            ;***************************************
1340  17A5            ;* TEST TO SEE IF ALL GENERATIONS DONE *
1350  17A5            ;***************************************
1360  17A5  C6FE                     DEC  GENCTR
1370  17A7  D009                     BNE  ON3
1380  17A9  A900                     LDA  #0
1390  17AB  C5FF                     CMP  GENCTR+1
1400  17AD  D001                     BNE  ON4
1410  17AF  60                       RTS
1420  17B0  C6FF      ON4 DEC  GENCTR+1
1430  17B2            ;*****************************
1440  17B2            ;* TEST FOR STOP KEY CLOSURE *
1450  17B2            ;*****************************
1460  17B2  20E1FF    ON3 JSR  STOP
1470  17B5  D005                     BNE  ON5
1480  17B7  A960                     LDA  #$60
1490  17B9  8D2E17                   STA  VAR
1500  17BC  4C0017    ON5 JMP  START
1510  17BF            ;******************************
1520  17BF            ;* COPY RAM STORE BACK TO VDU *
1530  17BF            ;******************************
1540  17BF  A2FA                     LDX  #250             LOOP 250 TIMES
1550  17C1  BDEE1B    MOVE3          LDA  RAMST-1.X
1560  17C4  9DFF7F                   STA  SCREEN-1,X
1570  17C7  BDE81C                   LDA  RAMST+249,X
1580  17CA  9DF980                   STA  SCREEN+249,X
1590  17CD  BDE21D                   LDA  RAMST+499,X
1600  17D0  9DF381                   STA  SCREEN+499.X
1610  17D3  BDDC1E                   LDA  RAMST+749,X
1620  17D6  9DEDB2                   STA  SCREEN+749,X
1630  17D9  CA                       DEX
1640  17DA  D0E5                     BNE  MOVE3            BRANCH IF < 250 LOOPS
1650  17DC  60                       RTS
```

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Norwegian CBM64 user wishes to swap programs (tape only). I have about 350 titles (all with turbo). Send your list to: Eilif Lien, Nansetveien 76, 3250 Larvik, Norway.

Commodore C-16 starter pack + game + games book £60. 2×81 + 16K RAM + flight simulation £25. 19" colour T.V. £30. Accept £100 the lot. Tel: 01-942 1580 (evenings).

CBM64 software to sell. Titles include Encounter, Beach Head, Cliff Hanger, Lazy Jones, Chartbuster, Strip Poker, Zaxxon, Falcon Patrol, Ghostbusters and many more. Tel: 061-434 2375. Prices £1-£4.

CBM software to swap, tape only. Over 100 games including many American e.g. Gyruss, Gort, Archon, Soccer. Send your list for mine. Tim Connop, 3 Calverley Rd, Kings Norton, Birmingham B38 8PW.

Brand new — Future Finance or Stock Control both boxed and sealed. New — £75 each. Will accept £45 o.n.o. each. Contact 04446 3516. S. Hunt (evenings).

Commodore Music Maker for musicians and beginners plus SFX Keyboard overlay. Unwanted prize. Phone Anthony 0622-813794. £20 only.

CBM64 software for sale and swap. I've got more than 700 programmes, commercial and games. Write to Frank Drexler, 46 The Warings, Heskin, Chorley, Lancs PR7 5NZ.

CBM64 user in Norway wishes to swap software on tape. I've got more than 400 titles. Please send list to Per Chr Lökke, Peen Gyntvei 17, 1700 Sarpsborg, Norway.

CBM64 user wants to swap disks, cassettes and manuals. Send your list to H. Palonen, Myrullveien 19A, 9510 Elvebakken, Norge.

For sale — Spectrum 48K + Pro-joystick interface, lots of software, books etc. £140. Write to Asheet Malhotra, 67 Newlands Ave, Shirley, Soton. SO1 5EQ. Phone 0703-787528 after 5pm.

Swap my part time business (car windscreen security engraving), complete with all you need to start earning £8 or more per car, for disc drive(s) or printer suitable for 3008 PET. 0708-867430.

Unwanted programs! New, unused, originals, ½ price. Send S.A.E. (e.g. Hobbit, Skramble etc. Also some for Spectrum 48K). Jones, Limietlaan 44, Den Bosch, Holland.

CBM64 owner wants to swap software. Over 600 programs only tape. Send your list to: Tore Vaerlien, St. Olavsgate 5, 2400 Elverum, Norway.

CMB64 disk software to swap. Unopened Easyscript and Manual (offers). All originals. (0904) 707699.

Danish CBM64 user with 1000 programs would like to swap tape and disk. Send your list in return of mine. Write soon to: Ernst Jensen, StrØve 14, 3320 Skaevinge, Sjaelland, Denmark.

CBM64 + cassette recorder + over 60 latest software games on cassette and cartridge + books + loads of mags — only £300. Tel: 01-470 5543 evenings.

CBM64 owner wants to swap games and tips with other Commodore users anywhere. Disk and tape. Please send your list to me. Oddvin, Olavsgt 17, 6150 Ørsta, Norway.

Currah speech 64 unit, includes free posters, users manual and full one year guarantee. Unwanted gift, postage possible, £23.00. Contact Andrew Philpott, 115 Fordwich Rise, Hertford, Herts SG14 2DF. Tel: Hertford 57671.

For Sale — Supersoft Micro Assembler — £45 ono. Phone Watford (0923) 48406 (evenings).

CBM64 games to swap. Tape only. We have 300+ programs. All lists looked at, especially American, Norwegian, Italian. Phone Bootle 9334132. Write Nick, 47 Moss Lane, Litherland, Liverpool, England L21 7PR.

CBM64, I have a MCS-801 printer and would like to buy any secondhand software for it. Phone 01-574 2536 after 6pm, ask for Sanjay.

Hello swappers — nice day we're having! More than 1500 programs available for your C-64. Also some stuff for Apple and Atari. Post your lists and animals to J. Torppa, Kaustisenpolku 3B32, 00420 Helsinki, Finland.

Belgian CBM64 looks for programs to decode RTTY & CW (Morse). Michael Mairesse, General Lemanstraat 39, 2018 Antwerpen, Belgium.

CBM64, I would like to exchange software on tape many titles. I guarantee all letters will be answered. Please write to Ray, 13 Beatty Avenue, Chorley, Lancs PR7 2PR.

CBM64 user wishes to swap software on disk only. All letters answered, send lists to John, 80B Mt Pleasant Road, Lewisham, London SE13 or phone 01-690 4242 after 6pm.

Wanted 1541 disk drive. Will pay £100 if in good working order. Also wanted colour monitor and CBM64, will consider, buying as package. Send details: Motson, 59 Wynl Crescent, LS29 8ND.

CBM64, 1541 disk drive, C2N, covers, Shinwa CP80 printer with interface, spare ribbon, 'Superbase' 64, Easyscript, Money Manager, Busicalc, joysticks, paddles, books, games, disks, £700 ono. Tel: 0703 454478 evenings & weekends.

CBM owner wishes to swap software with anyone anywhere, 400+ games on tape and disk. Send list to David Fisher, 129 Hartley Road, B'ham B44 ORD.

Commodore SX64, Easyscript, Superbase 64, Anagram sales ledger, manuals, disks, £350. Centronic leads. Tel: 061-707 2773.

CBM64 owner wishes to swap games, 400+ games on tape. Send list to Harry Lassche, Pieter Langendÿkstraat 49, 7471 n.c. Goor, Holland.

CBM64 user wants to swap programs. Have more than 1,000 programs. Please write and send your list to: KFT, F Scholtenstraat 91, 1051 E W Amsterdam, Holland.

Rototronics flight case for CBM64, £25. Prism VTX 5000 for Spectrum, £45. Sell or swap W.H.Y. Phone 0346 24208/ 24994.

Wanted — good program for running home catalogue (Freeman, Kays etc) on disk. Write:— Bill Green, 35 Broomfield Avenue, Leigh-on-Sea, Essex SS9 4BL.

CBM64 software all less than 2 months old, disks:— Easyscript £40, Future Finance £30, Micro Magpie £25, Hobbit £10, Dragonworld £12, Highflyer £6, Cassettes: Busicalc £5. Contact Tan, 17a Moorland Avenue, Leeds LS6 1AP.

Commodore 64. I have 900 programs to swap. You must have 600 programs or more — only on disk. Arve Steinmo, Sandved Terrasse 42, 4300 Sandnes, Norway.

Easyfile database system for sale £30 ono (unwanted gift — as new). Contact Terry Hart, 17 Burns Gardens, Lincoln. Tel: 29643 or 29931 ext 369 (work).

CLASSIFIED

COMMODORE REPAIRS

VIC 20's — £12.50, C-64's — £15.00, 1540/41 — £20.00, and all Commodore systems. Send faulty machine with note describing fault to:

TRIDENT ENTERPRISES LTD,
37 Linden House, Common Road, Langley, Slough,
Berks SL3 8TT. Tel: (0753) 48785.

(Above prices are exclusive of parts, p&p and VAT). Field Service and Maintenance contracts available. Overseas enquiries welcomed. We also repair QL's, BBC's and Spectrums.

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Prof. George's **HORSE RACE FORECAST** program is a serious punter's aid to sensible betting. Available for: **Apple, Pet, Dragon 32 TRS-80, ZX81, BBC, NewBrain, Spectrum, CBM 64, Sharp MZ80A.**

Bureau of Information Science,
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Chalfont St. Giles, Bucks.

CBM 64 disk version now available!

CBM64 software for sale — worth £374, will sell for £200 or split. Write to R. Davies, 34 Treforthlan, Illogan, Redruth, Cornwall TR16 4RN or ring (0209) 842496 after 5.30pm.

PET 40 and 80 column and Commodore 64 program listing for 50p each. Around 1,000 to 2,000 programs. Write to R. Davies, 34 Treforthlan, Illogan, Redruth, Cornwall TR16 4RN.

Commodore 3032 computer for sale, £250, 4040 disk drive £400. Also 3022 dot matrix printer £150. Separate or £700 together. Tel: Seaford (0323) 890622 cash only, buyer collects.

For sale 1520 printer plotter & paper pens. Reset and device number switches, as new, £50. Koala pad & software, £50. Tel: 0942 671584.

CBM64 software (tape). Beach Head, Quill, Return to Eden, Spy Vs Spy, Nato Commander, American Football, Music Machine, £5. M. Dalgety, 29 Strathern Road, West Ferry, Dundee DD5 1PP.

All VIC users, I would like to start a games swap including expansion games. Please send a list to David Webber, 22 Tertcombe Road, Gosport, Hants or ring (0705) 588781 after 5.30pm.

COMMODORE 64 SOFTWARE

DATABASE: Datafile — a database with very powerful options. Includes:— print all/selective records, delete, amend, save, load, copy, alphanumeric sort, user defined fields, memory check, total numeric fields, multi-field interrelational, wildcard and search between limits. Multiple file option, and many more. Fully menu driven with complete instructions. Disk and cassette fully compiled. Outstanding value.

CBM 64 (compiled) cassette **£7.45**
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CBM 64 (compiled) cassette **£8.25**
CBM 64 (compiled) disk **£10.75**

All programs complete with full documentation and guarantee and can be used with all direct connect CBM 64 printers including 1520 printer plotter and most centronics (with suitable hardware interface). Prices include VAT. Packing and fast delivery by 1st class mail.

Cheques/PO's to:
A & C SOFTWARE
Dept. 2, 75 Oakthorpe Gardens, Tividale, West Midlands B69 2LF.
Tel: 021-557 8596

CBM64 — I have more than 400 games to swap. Disk or tape. Send your list to Helge Stian Telle, Lerumsvei 25, 5073 Skaalevikneset, Bergen, Norway.

Programmer requires copy of JCL HS-64 assembler. Also interested in swapping utilities. Ring Alan on Sheffield (0742) 662005.

Swap Zork I, Zork II, Zork III suspended. All only used once, for any disk-based games & many other games to swap, tape and disk. Only disk games wanted or disk tips. Paul 01-961 4659.

CBM64, C2N recorder, MPS printer, £100 of software, books and mags, worth £700, try me £350 ono. Ask for Tony 01-902 6392.

SOPHISTICATED GAMES FOR VIC 20 & CBM 64

VIC/64 CRICKET Realistic games of tactical skill and luck. Ball by ball commentary with full scorecard and all the major rules of cricket correctly interpreted. Printer/game save facilities.

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ADULTS ONLY for VIC 20 + 16K expansion 6.99
64 ADULTS ONLY 6.99

DISC VERSIONS AVAILABLE FOR ALL GAMES — £2.00 EXTRA
ALL PRICES INCLUDE P&P (UK ONLY). GAMES SOLD SUBJECT TO CONDITIONS OF SALE WHICH ARE AVAILABLE ON REQUEST. PLEASE WRITE OR PHONE FOR DETAILS OF OUR FULL RANGE OF SOPHISTICATED GAMES

Dept CCI, 27 Queens Road, KEYNSHAM, Avon BS18 2NQ.
Tel 02756-3427

CBM64 software for sale, originals, BC Basic £8, Daley's Decathlon £4, Manic Miner, Booga-Boo, Hover-B, Revenge of M.C., Project Gibralter, Wheelin' Wallie all £3. Horse Race Forecast £10. Phone (0429) 870140 after 4pm ask for Steven.

CBM64 disk software for sale, Oxford Pascal, Easyscript, Programmers utilities (CBM). Also Simons Basic and Seikosha GP100VC printer (same as 1525) offers to David Swift, 40 Romsey Road, Winchester, Hants.

CBM64 software disk and tape to swap includes Pitstop 2, Buck Rogers, Sam Speech, Track and Field, Baseball (Gamestar), Stealth etc. Phone Lea Valley 718606 ask for Jim.

1701 colour monitor £150, Seikosha GP100VC printer £110, CBM64 computer £120, books, taper, joystick all half price. Phone Eastbourne (0323) 33310 evenings.

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COMPUTERISED SPEECH

Played Ghostbusters or Impossible Missing on the CBM 64? High Quality speech? Well here is a Powerful Piece of software which allows you to use quality speech in your own programs. It is even more powerful than most Hardware Speech Synthesiser! Because it is software, it is more flexible as you have full control over the way he speaks; speed, accent, etc. You can leave it as an American French man or make him speak like an old woman, young baby, foreigner, space creature; limited only by your imagination! It runs as an Extended Basic so programming is simple. Example, you want it to say "HELLO THERE. NICE DAY.", you just type SAY "HELLO THERE. NICE DAY."; even a child can use it. Brilliant for schools ("spell . . ."), business programs ("weeks sales are as follows . . ."), home or just to impress someone ("fancy a date?").

£12.00 tape/£14.00 disk. Small price to pay for such a powerful program. Well recommended.

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C-16 for sale & data cassette unit + £60 worth of software including Air Combat Emulator, Decathlon, Hunchback II and many more + C-16 games book, user manual & Commodore magazines, £109 ono. Tel: Tunbridge Wells 44773.

Wanted 1541 disk drive and modem must be in good nick. I will collect. Please ring Stanley (0207) 284713.

Wanted: C-16 software. I already have some games, cassette only. Also wanted: Quickshot 2, I would like a C-16 penpal. Contact Stephen Catterson, 2 Polo Gardens, Troon, Ayrshire KA10 6LJ. Tel: (0292) 311 559 (after 4pm).

Superpet 8032 plus 6809 processor with extra 64K, RS232, Basic, Pascal, APL, Cobol, Marcro Assembler. Full documentation, utility disks. Lots of business, games and educational software. Offers? Tel: Medway (0634) 53556.

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For the Commodore 64/PET 3000, 4000, 8000. Also wide range of programs for **experienced astrologers**

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Hemel Hempstead, Herts HP3 8ER.
Tel: 0442 51809

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CBM64 penpals wanted especially ladies. GB or anywhere, all genuine letters answered. Interest in computers not essential. Wanted Simons Basic. Gent 40. Mike Peters, 37 Brattleby Crescent, Lincoln, Lincs, England LN2 2EB.

CBM 4040 disk drives, complete with CBM 4032, inbuilt Visicalc, hard wired C2N cassette. All in very good condition, £475. Tel: (061) 941 3102.

Modem CBM64 for sale four months old, genuine reason for sale, £75 ono. Phone 0903 45902 ask for Ian.

Norwegian CBM64 user wants to swap software. Have approx. 250. Write to Espen Toranger, Damsgardsgt 210, 5031 Laksevag, Norway.

CBM64 user wants to swap programs. Have about 450 programs tape only. Please send your list to: Bjorn Gjelsten, Box 59, 6010 Spierkavik, Norway.

CBM64 computer, C2N cassette unit, 1701 colour monitor, 1541 disk drive plus some of the best software worth £400+. Overall value over £1,000. All excellent condition. Bargain at £550. Tel: Bury 260.

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VIC 20 + **16K** switchable RAM pack, C2N datasette, super-expander, Omega Run cartridge, Intro to Basic part 1, 4-slot motherboard, vgc — £65 ono. Contact James Rocks (phone 01-291 1250 ext 36). V.G.C.

CBM64 user wants to swap programs. Have CA 170 of them but still getting more. Turbo tape cassette only. Send list to: Per Olav Floe, Box 56 N-2640 Vinstra, Norway.

VIC 20, C2N, 3/8/16 switchable RAM pack, Intro to Basic part 1, books, over 20 games, brand new power pack, recently serviced by Commodore, £120 ono. Tel: Chelmsford (0245) 267669 after 1pm.

CBM64 owner wants to swap programs (disk only). CA 800 programs. Please send your list to Tor Solgaardknattaas VN. 18, 1713 Graalum, Norway.

CBM64 software to swap. Titles include Farenheit 451, Air Wolf, Gryphon, Amazon, Spellunker. I have about 1200 titles. All letters answered. Write to: Alexander Matuz, Yvenlia 86, 1713 Grålum, Norway.

CBM64 £125, cassette £25, 1541 disc drive £150, 1525 printer £150, VIC 20 £50, Simons Basic £25, Forth cartridge £15, Programmers reference guide £5. All in excellent condition. Tel: Maidenhead (0628) 27708.

VIC 20 cassette recorder + 16K switchable RAM + Quickshot II + over 30 games and cassettes & literature — £125 ono — Phone 061 748 3632.

VIC 20 complete with over £50 worth software including 5-11 year-old educational software, 16K and 3K expansion. Pirate Cove adventure game, Intro to Basic part 1, worth over £200. Accept £75 ono. (Cambridge) 862148.

Wanted — **VIC 20** RAM expansion cartridge. Please write giving details and price to 7 Stockbury House, Waltham Close, Orpington, Kent BR5 4QN.

CBM64 software including Impossible Mission, Staff of Karnath, Simons Basic. Sell half price or swap for software or cartridge or tape-based word processor or 80-col card. Mr D Talbot, 11 Broadgate, Darwen, Lancs.

Commodore SX-64 portable (includes disc-drive, colour monitor and cassette interface) CBM64 compatible, 1520 plotter, £500, original software and accessories. As new, £650 ono (for quick sale). Tel: (0392) 54188 (8pm-9pm Weds and Thurs).

CBM64 software to swap. Have over 700 titles plus good utilities. Send list to Mark, 14 Fife Street, Gateshead, Tyne & Wear NE8 3RR. Tel: (0632) 4775923.

CBM64 owner wishes to swap disk software with users here and overseas. Have around 900 programs. Send list to J. S. Kauldher, 40 Stanley Road, Southall, Middx UB1 1PB, England. Tel 01-571 2870 after 4.30pm.

German CBM64 owner wants to swap C64 software, all countries, only disk, over 2,000 titles. Send your list to Rainer Ossenkamp, Braunsstrasse 21, 4050 Moenchengladbach 1, W. Germany.

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CBM64 software for sale, tapes and cartridges, wide range, cheap, some new. Phone Marlow 74371.

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CBM64 with datasette for sale, £125. Also for sale are cassette-based and disk-based games software. Phone Iain on 0628 39480 (pm).

Wanted — Commodore PET 3032 computer. Also disk unit and printer. Kelly, Essex. Tel: (024541) 3581.

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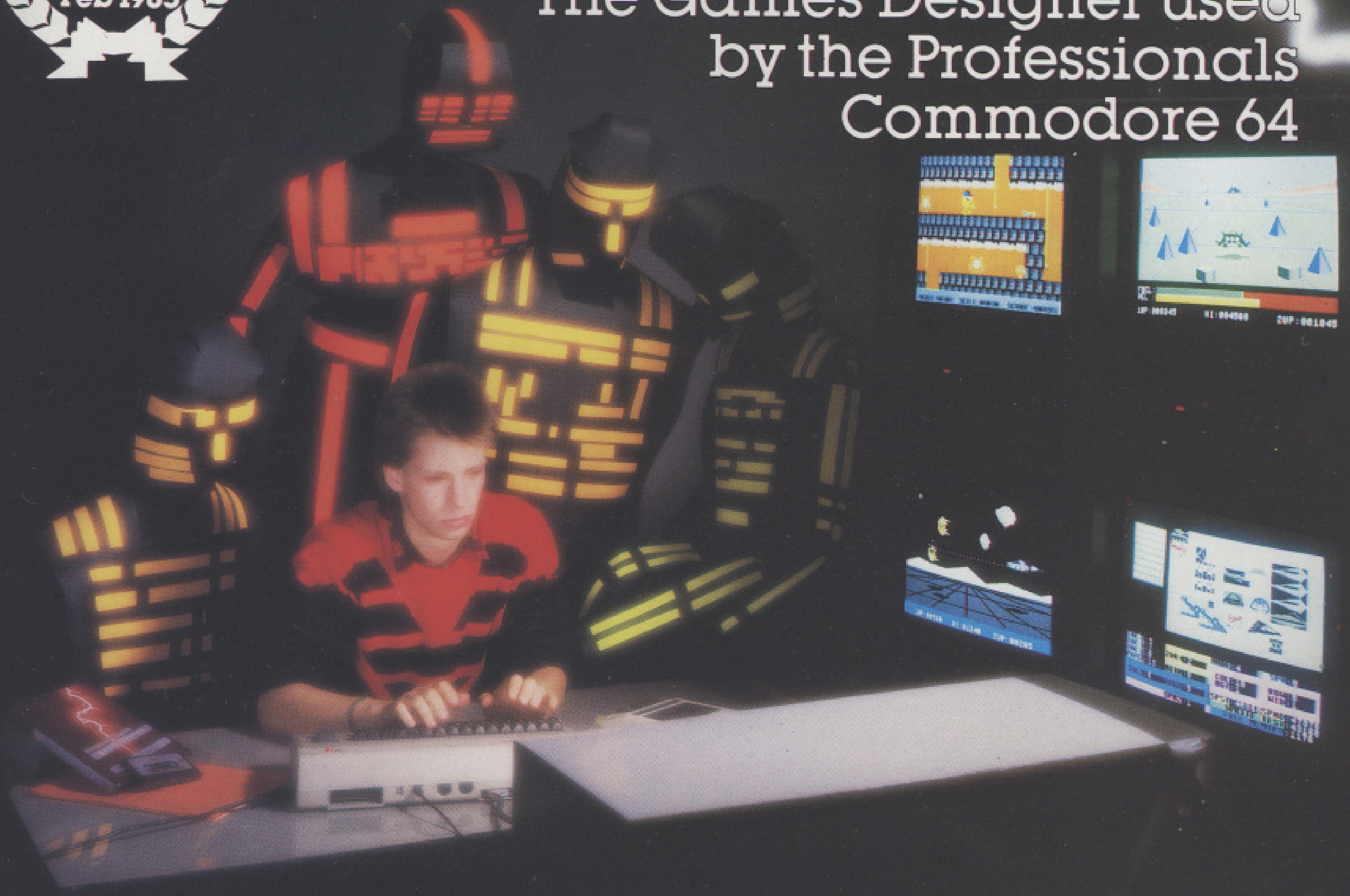

Now, without any knowledge of machine code, you can write fast, smooth, professional, totally original games and market them without paying royalties.

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MULTI-TASKING Because White Lightning uses **interrupts**, you can effectively run two programs at once. This means, of course, that games like Space Invaders and Defender can be written without complex timing calculations. So while one program smoothly scrolls the landscape, the second amimates the other characters. This is undoubtedly one of White Lightning's most powerful features.

MARKETING AND PORTABILITY Although White Lightning uses an integer FORTH as its host language, programs can be written in a combination of Commodore BASIC, FORTH, IDEAL and machine language. The final program will run independently of White Lightning and absolutely no marketing restrictions are imposed.

BASIC LIGHTNING In addition to the White Lightning program itself, the package also includes an extended BASIC. This BASIC adds more than **200** reserved words including all the IDEAL commands, procedures and a full set of **structured programming commands**. Up to five tasks can be run simultaneously. BASIC Lightning is also available separately.

SPRITE DESIGN White Lightning comes complete with a separate sprite designing program. Two libraries of sprites are included and up to 255 sprites can be designed with loading and saving facilities between sessions.

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Choosing the right computer is a good start — but can you find the right software?

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INTERDICTOR PILOT

At SUPERSOFT we're very conscious of the fact that people who spend several hundred pounds on computer equipment are looking to do rather more than play Space Invaders.

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For home, club or small business use BUSICALC 1 should pay for itself in no time at all; for larger companies we recommend BUSICALC 3, one of the few really valuable programs that you can learn to use in a day.

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